Vol. 1021 Number 5

OFFICIAL GAZETTE

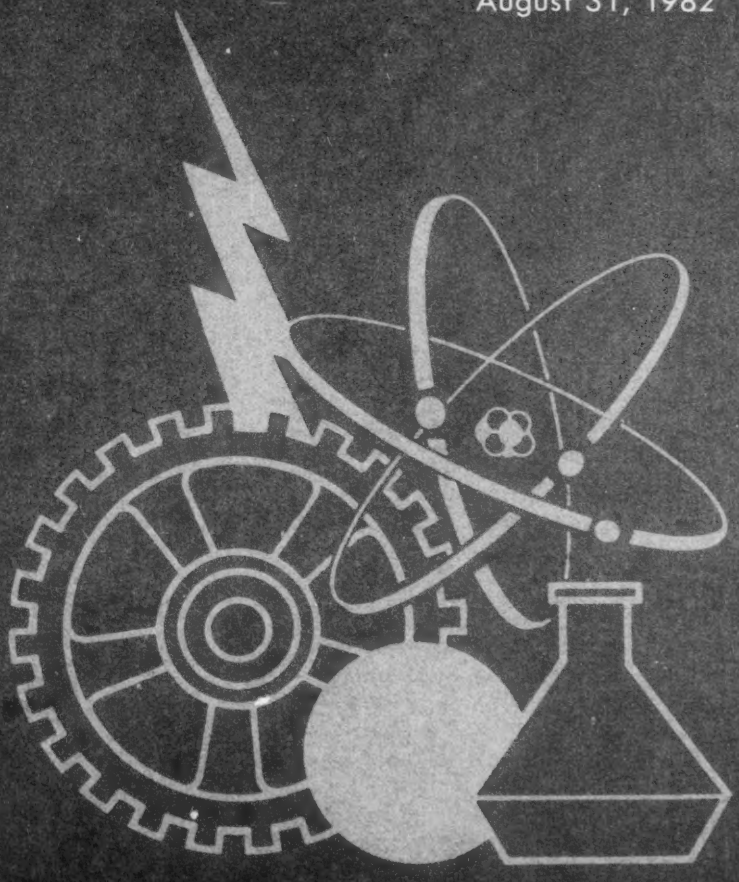
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

August 31, 1982



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U.S.
DEPARTMENT
OF COMMERCE

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Trademark
Office

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

August 31, 1982 Volume 1021 Number 5

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS AND DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries and the most recent PCT rule changes see the notices appearing in the Official Gazette at 1001 O.G. 14 on Dec. 9, 1980 and at 1012 O.G. 20 on Nov. 17, 1981.

Note that the international fees have been increased as of Jan. 1, 1982. The current schedule of fees is as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Fees	
Basic Fee (first 30 pages)	270.00
Basic Supplemental Fee (for each sheet over 30)	6.00
Designation Fees	65.00

GERALD J. MOSSINGHOFF,
Jan. 19, 1982. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,469,571, Re. S.N. 372,431, Filed Apr. 27, 1982, Cl. 128/654, DEVICE FOR ADMINSTERING A FLUID INTO THE INTESTINAL TRACT, Alexander A. Vass, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 335

3,883,406, Re. S.N. 355,429, Filed Mar. 8, 1982, Cl. 204/95, PROCESS FOR RECOVERING ELECTROLYTICALLY PRODUCED ALKALI METAL CHLORATES, Thomas F. O'Brien, et al., Owner of Record: *Inventor,* Attorney or Agent: David M. Bunnell, Ex. Gp.: 116

4,069,662, Re. S.N. 392,439, Filed June 28, 1982, Cl. 60/226R, CLEARANCE CONTROL FOR GAS TURBINE ENGINE, Ira H. Redinger, Jr., et al., Owner of Record: *United Technologies Corp., Hartford, Conn.,* Attorney or Agent: Norman Friedland, et al., Ex. Gp.: 343

4,081,556, Re. S.N. 368,683, Filed Apr. 15, 1982, Cl. 426/2, PRODUCT FOR FEEDING BEES, Jean-Louis Louveaux, Owner of Record: *Institut National De La Recherche Agronomique, Paris, France,* Attorney or Agent: Thomas P. Sarro, Ex. Gp.: 172

4,133,874, Re. S.N. 392,525, Filed June 28, 1982, Cl. 424/38, LIPID ENCAPSULATED HEMOGLOBIN CELLS, Irving F. Miller, et al., Owner of Record: *University of Illinois Foundation, Urbana, Ill.,* Attorney or Agent: William E. Dominick, et al., Ex. Gp.: 123

4,142,875, Re. S.N. 142,592, Filed Apr. 21, 1980, Cl. 55/72, PROCESS FOR THE PURIFICATION OF SCRUBBING SOLVENTS BY REMOVAL $NI(CO)_4$, Gerd Bohmholdt, et al., Owner of Record: *Veba Oel Aktiengesellschaft, Gelsenkirchen-Buer, Germany,* Attorney or Agent: Arnold Sprung, et al., Ex. Gp.: 177

4,182,802, Re. S.N. 328,961, Filed Dec. 12, 1981, Cl. 526/264, HYDROPHILIC POLYMERS AND CONTACT LENSES OF HIGH WATER CONTENT, Samuel Loshaek, et al., Owner of Record: *Wesley-Jessen, Inc., Chicago, Ill.,* Attorney or Agent: Warrick E. Lee, Ex. Gp.: 144

4,191,212, Re. S.N. 338,557, Filed Jan. 11, 1982, Cl. 137/601, MULTIPLE BLADE DAMPER ASSEMBLY, Donald K. Hager, Owner of Record: *Inventor,* Attorney or Agent: Peter G. Mack, Ex. Gp.: 341

4,204,165, Re. S.N. 379,562, Filed May 18, 1982, Cl. 455/226, MULTICHANNEL COHERENT RECEIVER, Patrick J. Ready, Owner of Record: *Inventor,* Attorney or Agent: Louis J. Bachand, et al., Ex. Gp.: 233

4,213,721, Re. S.N. 383,931, Filed June 1, 1982, Cl. 408/54, ALIGN BORING MACHINE, R. Warren Aldridge, Jr., Owner of Record: *Inventor,* Attorney or Agent: Charles A. Phillips, Ex. Gp.: 324

4,242,999, Re. S.N. 247,516, Filed Mar. 25, 1981, Cl. 123/548, SELF-REGULATING HEATER, Alfred Hoser, Owner of Record: *Inventor,* Attorney or Agent: David S. Kane, et al., Ex. Gp.: 342

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,193,797, Reexam. No. 90/000,234, Requested: July 30, 1982, Cl. 430/258, METHOD FOR MAKING PHOTORESISTS, Abraham B. Cohen, et al., Owner of Record: *E.I. du Pont de Nemours & Co., Inc.* Attorney or Agent: Weston B. Wardell, Jr., Ex. Gp.: 166, Requester: E.I. du Pont de Nemours & Co., Inc. Wilmington, Del.

4,219,318, Reexam. No. 90/000,230, Requested: July 21, 1982, Cl. 425/190, APPARATUS FOR PREPARING FRESH FARINACEOUS PASTES, Alfredo Cavalli, Owner of Record: *Inventor,* Attorney or Agent: Hubbell, Cohen, Stiefel & Gross, Ex. Gp.: 147, Requester: Osrow Products Corp., Kirschstein, Kirschstein, Ottinger, Cobrin, P.C., New York, N.Y.

DEPARTMENT OF COMMERCE
Patent and Trademark Office
37 CFR Part 2

[Document No. 2512-96A]

Trademark Applications and Examination Proceedings; Trademark Interference, Concurrent Use, Opposition and Cancellation Proceedings; Trademark Post-Registration Proceedings

Agency: Patent and Trademark Office, Commerce.

Action: Proposed rulemaking; change of hearing date and extension of comment period.

Summary: On June 29, 1982 a notice was published in the **Federal Register** (47 FR 28324–28343) announcing Sept. 27, 1982 as the date for a hearing concerning proposed amendments to the rules of practice in trademark cases. Because that day is Yom Kippur, a religious holi-

day for many people, the hearing has been rescheduled for the following Monday, Oct. 4, 1982, at 10:00 a.m. The period for filing comments is extended to that date as well.

Date: The date on which the hearing will be conducted is changed to Oct. 4, 1982, at 10:00 a.m. The period for filing comments is also changed to Oct. 4, 1982.

Addresses: The hearing will be held in Room 11C24 of Building 3, Crystal Plz., 2021 Jefferson Davis Hwy., Arlington, Va. Comments may be mailed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

For Further Information Contact: Miss Janet E. Rice by telephone at (703) 557-3551 or by mail marked to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

GERALD J. MOSSINGHOFF,
July 29, 1982. *Commissioner of Patents and Trademarks.*

[FR Doc. 82-21128 Filed 8-4-82; 8:45 am]

BILLING CODE 3510-16-M

National Technical Information Service

U.S. GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Government Inventions and Patents
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents
National Technical Information Service
U.S. Department of Commerce.

SN 6-363,425. PO_2 "FIBER OPTIC PROBE." Dept. of Health & Human Services.

SN 6-112,980. (Patent 4,337,181) "BIODEGRADABLE STARCH-BASED BLOWN FILMS." Dept. of Agriculture.

SN 6-141,764. (Patent 4,337,763) "ILLUMINATED SURGICAL INSTRUMENT." Dept. of Health & Human Services.

SN 6-153,057. (Patent 4,337,028) "CATALYTIC MONOLITH, METHOD OF ITS FORMULATION AND COMBUSTION PROCESS USING THE CATALYTIC MONOLITH." Environmental Protection Agency.

SN 6-161,823. (Patent 4,339,295) "HYDROGEL ADHESIVES AND SANDWICHES OR LAMINATES USING MICROWAVE ENERGY." Dept. of Health & Human Services.

SN 6-182,632. (Patent 4,337,196) "METHOD FOR PRODUCING 3,6-BIS(CARBOETHOXYAMINO) -2-5-DIAZIRIDINYL-1,4-BENZOQUINONE." Dept. of Health & Human Services.

SN 6-192,261. (Patent 4,338,608) "TRIPLE-BEAM OFFSET PARABOLOIDAL ANTENNA." Dept. of Commerce.

SN 6-200,111. (Patent 4,337,129) "REGENERATION OF WASTE METALLURGICAL PROCESS LIQUOR." Dept. of Interior.

SN 6-229,215. (Patent 4,337,271) "ERYTHRO-9,10-DIHYDROXYOCTADECAN-1-OL ACETATE A BOLL WEEVIL ANTI-FEEDANT." Dept. of Agriculture.

SN 6-233,422. (Patent 4,337,226) "RECOVERY OF PLATINUM-GROUP METALS FROM ORES." Dept. of Interior.

SN 6-283,596. (Patent 4,337,549) "CARCASS CLEANING UNIT AND CONTAINMENT CHAMBER." Dept. of Agriculture.

SN 6-291,180. (Patent 3,915,651) "DIRECT DIGITAL CONTROL PIPETTE." Dept. of State.

SN 6-300,834. (Patent 4,337,227) "RECOVERY OF CHROMIUM FROM WASTE SOLUTIONS."

Examiner Education Program Contributions Tax Deductible

The Internal Revenue Service has issued a ruling that financial contributions made in support of the Patent Examiner Education Program are tax deductible for the taxable year in which the contributions are made. The ruling is reproduced below.

July 20, 1982.

Dear Mr. Mossinghoff:

This is in reply to your request for a ruling whether contributions to your office under the following circumstances are deductible under section 170 of the Internal Revenue Code.

The Patent and Trademark Office of the Department of Commerce is promoting a Patent Examiner Education Program, which will improve the capabilities of its patent examiners to make decisions on patentability. That, in turn, will improve the quality of patents issued by the Office. Private industry is being asked to provide the funds for the Program because funds are not available from Congressional appropriations or fees received by the Office. Industry is also being asked to make commercial facilities available for visits under the Program. It is not necessary that a person who makes a facility available for visits also make a financial contribution. The identification of donors and gift amounts will be known to about four individuals in the Office. Neither the examiners nor the individuals assigning examiners to visit industrial facilities will know the donors or amounts of their gifts. Donors to the Program will not have any part in the assignment of examiners to visit the facilities.

Section 170 of the Code provides, subject to certain limitations, a deduction for contributions and gifts to or for the use of organizations described in section 170(c), payment of which is made within the taxable year.

Section 170(c)(1) of the Code provides, in part, that the term "charitable contribution" means a contribution or gift to or for the use of the United States, but only if the contribution or gift is made for exclusively public purposes.

The term "charitable contribution," as used in section 170 of the Code, requires a contribution or gift. A contribution or gift, for the purposes of section 170, is a voluntary transfer of money or property made by the transferor without receipt or expectation of financial or economic benefit. If the transferor receives, or can reasonably expect to receive, sufficiently substantial financial or economic benefits in excess of those that would inure to the general public, no deduction under section 170 is allowable. *United States* v. *Transamerica Corp.*,

392 F.2d 522 (9th Cir. 1968); and *Singer Co.* v. *United States*, 449 F.2d 413 (Ct. Cl. 1971).

Rev. Rul. 69-90, 1969-1 C.B. 63, holds that voluntary payments by merchants and property owners to a city to provide unrestricted public parking facilities located in the general area of the donors' businesses and properties are charitable contributions. This conclusion is based on the fact that the payments were not consideration for an agreement on the part of the city to provide parking facilities for the use of the contributors. The parking spaces were for the use of the general public and the amount of the contributions was not based on proximity or probable use. Thus, there was no special economic benefit conferred on the contributor by reason of the contribution.

In Rev. Rul. 73-296, 1973-2 C.B. 67, the Service considered whether contributions to United States Army Unit Funds, which are integral parts of the Army, are deductible under section 170 of the Code. The Funds could accept contributions if acceptance was found to be in the best interest of the Army and did not involve the granting of special privileges to the donor. The revenue ruling concludes that contributions to the Funds under these circumstances are deductible as contributions to or for the use of the United States under section 170, provided the contributions are for exclusively public purposes.

Contributions to the Program do not confer special privileges on the donors. The contributions provide funds for a program for which funds are not available from Congressional appropriations.

Accordingly, amounts contributed to the Program are deductible under section 170 of the Code, subject to the limitations provided by that section, as contributions to or for the use of the United States, provided the contributions are used exclusively for public purposes.

Sincerely yours,

Anthony Manzanares, Jr.,
Chief, Individual Income Tax Branch

The Patent Examiner Education Program, conducted jointly by the U.S. Patent and Trademark Office and Intellectual Property Owners, Inc., is described in the notice published in the Official Gazette of May 25, 1982, 1018 OG 39.

Aug. 3, 1982

DONALD J. QUIGG,
Deputy Commissioner of Patents and Trademarks.

Status of PTO Services

The following is an update of the status of PTO services as of Aug. 3, 1982:

Service Item	FY 1982 Performance Goal (Calendar Days)	Actual	Comment
Internal Mail Processing & Delivery	4	5.0	See note below.
Filing Receipts:			
Patents	22	50	Reduction from 100 days in February.
Trademarks	30	30	Last month's 13 day backlog has been worked off.
Patent Copies:			
Window Coupons	5	93% within 5 days 99% within 10 days	
Mail Coupons*	15	99% within 15 days	
Letter Orders*	20	77% within 20 days	
Certified Copies:			
Trademark Regs.	30	20	
Applications-As-Filed*	20	93% within 15 days	
File-Wrapper/Contents*		11% within 15 days 77% within 30 days	
Walk-up Certification	1	99% within 1 day	Service now includes applications-as-filed.
Trademark Search Room:			
Filing Drawings	21	41	
Filing Reg. Certificates	3	11	
Patent Assignments	15	74	Backlog due to unavailable funding. Expect reduction in FY 1983.
Trademark Assignments	21	105	Backlog due to unavailable funding. Expect reduction in FY 1983.
Patent Official Gazette	Issue Date	On Schedule	
Patent Grants	Issue Date	On Schedule	
Trademark Official Gazette	Issue Date	On Schedule	
Trademark Registrations	Issue Date	2 days late	

*Figures exclude mail processing and delivery time.

Local Certification Service

The certification desk in the patent Public Search Room now accepts user produced copies of patent applications-as-filed for certification. Users of this service are required to prepare copies of the application as it appeared at the time of filing, and should present the copies, together with the application file at the desk. If the copies are proper, complete, and in order, a certificate will be affixed. The current charge for this service is $2.00 per certificate.

Filing Receipts

The time required to mail a filing receipt for a patent application has been reduced from 100 days in February to less than 50 calendar days at the present time. This reduction will continue, and we hope to mail filing receipts routinely within one month by Dec. 1982.

Aug. 3, 1982.

THERESA A. BRELSFORD,
Acting Assistant Commissioner for Administration.

PATENT NOTICES

Certificates of Correction for the Week of Aug. 31, 1982

Re. 30,928	4,273,159	4,315,387	4,329,511
D. 263,203	4,276,617	4,315,520	4,329,560
3,744,552	4,279,199	4,315,564	4,329,601
3,960,708	4,281,241	4,317,829	4,329,721
4,003,838	4,282,062	4,318,278	4,329,970
4,022,904	4,284,460	4,319,899	4,330,035
4,084,901	4,287,318	4,320,529	4,330,513
4,092,376	4,287,346	4,320,933	4,330,745
4,126,617	4,287,451	4,320,969	4,330,788
4,128,418	4,292,108	4,321,173	4,330,802
4,150,310	4,292,643	4,321,917	4,331,103
4,153,485	4,293,699	4,322,241	4,331,513
4,165,400	4,295,709	4,322,820	4,331,603
4,165,680	4,295,882	4,322,926	4,332,985
4,172,414	4,297,030	4,322,982	4,333,174
4,206,039	4,297,085	4,323,673	4,333,414
4,218,939	4,297,150	4,324,141	4,333,501
4,225,715	4,298,405	4,324,325	4,334,115
4,226,167	4,299,608	4,324,624	4,334,214
4,229,252	4,299,737	4,325,136	4,334,974
4,235,975	4,300,008	4,325,373	4,335,080
4,237,147	4,300,573	4,325,858	4,335,178
4,237,799	4,301,296	4,326,109	4,335,225
4,238,583	4,303,066	4,326,284	4,335,266
4,238,830	4,303,594	4,326,514	4,335,349
4,242,399	4,304,332	4,326,532	4,335,370
4,245,862	4,304,776	4,326,594	4,335,630
4,246,370	4,306,215	4,326,795	4,335,692
4,246,643	4,306,912	4,326,941	4,335,701
4,251,819	4,307,475	4,327,232	4,335,847
4,252,487	4,309,163	4,327,864	4,335,849
4,253,600	4,309,639	4,327,981	4,335,903
4,257,730	4,309,974	4,327,996	4,336,074
4,258,600	4,310,000	4,328,097	4,336,112
4,261,799	4,312,215	4,328,225	4,336,212
4,263,421	4,312,496	4,328,305	4,336,615
4,263,457	4,312,934	4,328,412	4,336,931
4,264,609	4,313,435	4,328,526	4,337,257
4,264,628	4,313,967	4,328,575	4,337,317
4,266,541	4,314,227	4,328,600	4,338,349
4,270,088	4,314,485	4,328,734	4,338,522
4,271,012	4,314,760	4,329,288	4,339,673
4,272,127	4,315,316	4,329,391	

Dedications

3,428,933.—*Egon Gerstenberger,* Phoenixville, Pa. STRAIN GAGE UNIT AND METHOD OF APPLYING THE GAGE. Patent dated Feb. 18, 1969. Dedication filed July 8, 1982, by the assignee, *Vishay Intertechnology, Inc.*

Hereby dedicates to the Public the remaining term of said patent with all issued claims.

3,481,189.—*William H. Brennan,* Phoenixville & *Rudolph J. Wolf, Jr.,* Worcester, Pa. STRAIN GAGE MEASURING SYSTEM. Patent dated Dec. 2, 1969. Dedication filed July 8, 1982, by the assignee, *Vishay Intertechnology, Inc.*

Hereby dedicates to the Public the remaining term of said patent with all issued claims.

3,609,624.—*Bella Nagy,* Phoenixville, Pa. STRAIN GAGE AND METHOD OF BONDING THE GAGE TO A MEMBER UNDER TEST. Patent dated Sept. 28, 1971. Dedication filed July 8, 1982, by the assignee, *Vishay Intertechnology, Inc.*

Hereby dedicates to the Public the remaining term of said patent with all issued claims.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4559
Illinois	Chicago Public Library	(312) 269-2865
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF July 24, 1982

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	9-18-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-09-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-18-81
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	4-13-81
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	4-09-81
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	8-20-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	9-18-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-20-80
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	4-09-80
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-26-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	7-07-80
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	11-14-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	10-27-80
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	2-13-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	5-24-82
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	11-27-79

Expiration of patents: The patents within the range of numbers indicated below expire during July 1982, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,192,536 to 3,197,783, inclusive

Plant Patents ..... Numbers 2,543 to 2,545 inclusive

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,019

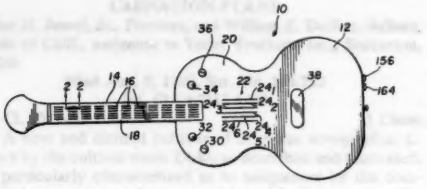
STRINGLESS ELECTRONIC MUSICAL INSTRUMENT

Fred J. Evangelista, 14 Linda La., Severna Park, Md. 21146

Original No. 4,177,705, dated Dec. 11, 1979, Ser. No. 973,801, Dec. 28, 1978. Application for reissue Jun. 25, 1980, Ser. No. 162,777

Int. Cl.³ G10H *1/00, 1/02*

U.S. Cl. 84—1.16 20 Claims



1. In an electronic musical instrument for simulating a stringed instrument having a [body portion adapted to carry] tone generating means [and a neck portion adapted to carry a finger-board assembly coupled to said tone generator means] and being operable to vary the tonal output thereof, the improvement comprising:

tone generator means including an electrical oscillator circuit [for each fundamental frequency desired to be simulated and] including switch operated circuit means [operable from said fingerboard assembly] for selectively changing [the] tonal [output] frequency [of said oscillator circuit];

[a respective] *an* output amplifier circuit coupled to said oscillator circuit and being energized in accordance with the operative state of a player actuated switch device; and

said player actuated switch device [consisting of] *comprising* a relatively thin [flexible blade-type] switch actuator member [mounted on edge in a substantially upright position on the outer surface of said body portion adjacent said fingerboard assembly,] *having a pair of sides and* being adapted [thereby] to be deflected bi-directionally [transverse] *transversely* [to said upright position] when strummed, struck, picked or plucked or bowed by a player, and at least one pair of electrical switch contacts located on each side of said actuator [element] *member*, wherein deflection of said actuator [element] *member* in either direction operates one of said pair of switch contacts to energize said output amplifier circuit.

Re. 31,020

METHOD OF MAKING A LINED CONDUIT SECTION

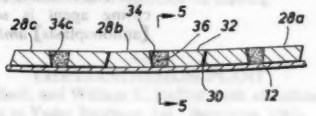
Charles F. Funk, Gulfport, Miss., assignor to Met-L-Parts, Inc., Gulfport, Miss.

Original No. 4,251,018, dated Feb. 17, 1981, Ser. No. 27,806, Apr. 6, 1979. Continuation-in-part of Ser. No. 850,285, Nov. 10, 1977, abandoned. Application for reissue Oct. 13, 1981, Ser. No. 310,652

Int. Cl.³ B23K *9/23*

U.S. Cl. 228—122 2 Claims

1. A method of lining an inside surface of a conduit with a plurality of strips of hard, relatively brittle, wear resistant material formed into elongated relatively narrow strips that have openings therethrough that have smaller cross-sectional areas on one side than on the other said method comprising the steps of disposing the inside surface in a generally upwardly facing horizontal position, placing a plurality of the strips on the upwardly facing surface in adjacent side-by-side position with the ends of the openings in the strips with the smaller cross-sectional area adjacent the upwardly facing surface, puddling weld metal briefly in first one opening and then another remote from the first while allowing the weld metal in



said first opening to cool, briefly puddling additional weld metal in said first one opening, likewise puddling weld metal in each said opening at plural brief intervals until each opening is filled to thereby maintain the temperature of the strips below that at which they will crack due to thermal stresses.

Re. 31,021

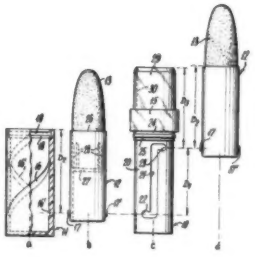
COSMETIC APPLICATOR WITH TRANSPARENT CONTAINER PORTION

Eric J. Idec, Madison; Edward F. Klimeck, Waterbury, and Eric A. Hultgren, Westport, all of Conn., assignors to Eyelet Specialty Co., Inc., Wallingford, Conn.

Original No. 4,208,144, dated Jun. 17, 1980, Ser. No. 26,755, Apr. 3, 1979. Application for reissue Feb. 13, 1981, Ser. No. 234,574

Int. Cl.³ B43K *5/12*

U.S. Cl. 401—194 19 Claims



1. In a container of the variety in which a carrier cup adapted to support cosmetic or the like substance at one end has cam-follower tracking engagement with axial propulsion cams of inner and outer rotatable tubular members, the outer tubular member being open at one end and having a cupped base closing its other end, and the inner tubular member being a sleeve including a portion projecting beyond the open end of said outer member to provide manual access for relative rotation of said members, the improvement in which said carrier cup is characterized by such an axial distance between the cam-follower location and said one end that in the retracted position of said carrier cup (a) said one end of said carrier cup is at substantially the open end of said outer member, and (b) the manually accessible projecting portion of said sleeve is translucent and enshrouds substantially the entire usable length of cosmetic or the like substance carried by said carrier cup.

Re. 31,022

MICHAEL ADDUCTS OF POLYMERIC MATERIALS USEFUL IN COATING APPLICATIONS

Stephen L. Buchwalter, Allison Park; Joseph F. Bosso, Lower Burrell, and Roger M. Christenson, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Original No. 4,248,753, dated Feb. 3, 1981, Ser. No. 937,386, Aug. 28, 1978. Application for reissue Mar. 26, 1981, Ser. No. 247,584

Int. Cl.[3] **C08L** *75/12, 63/02*

U.S. Cl. 523—418 **25 Claims**

8. The resinous composition of claim **[7]**. *6* in which the curing agent is selected from the class consisting of **[**amionoplasts**]** *aminoplasts* and capped isocyanates.

PLANT PATENTS

GRANTED AUGUST 31, 1982

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,882
CARNATION PLANT

Walter H. Jessel, Jr., Fremont, and William E. Duffett, Salinas, both of Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 5, 1980, Ser. No. 175,753
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—73 1 Claim

1. A new and distinct cultivar of *Dianthus caryophyllus,* L. known by the cultivar name Duke, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of commercial double flower type; flat flower form, twisting slightly with maturity; medium flower size, crimson red flower color with minimum color oxidation; fast flowering response; 4 to 6 flowers and buds showing color per flowering stem; medium peduncle length; strong peduncle strength; and tall plant height.

4,883
CHRYSANTHEMUM PLANT

Jack M. Meek, and William E. Duffett, both of Salinas, Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Jun. 30, 1980, Ser. No. 164,351
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct cultivar *Chrysanthemum morifolium,* Ramat., plant known by the cultivar name Accord, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; daisy capitulum type; dark red bronze ray floret color; yellow-green (immature) to yellow (mature) disc floret color; diameter across face of capitulum ranging from 75 to 100 mm. at maturity; uniform nine week photoperiodic flowering response to short days; tall plant height, short peduncle length; and semi-upright branching pattern.

PATENTS

GRANTED AUG. 31, 1982

ERRATA

For CLASS	See PATENT NO.
464–120	4,346,570
192–084	4,346,616
374–046	4,346,754
523–511	4,347,170
524–071	4,347,171
524–319	4,347,172
524–088	4,347,173
523–116	4,347,174
523–455	4,347,175
548–516	4,347,186
548–516	4,347,187
549–436	4,347,188
549–397	4,347,189
549–497	4,347,190
549–492	4,347,191
549–498	4,347,192
376–251	4,347,214
427–096	4,347,306
373–077	4,347,400
378–156	4,347,440
372–042	4,347,485
372–046	4,347,486

PATENTS

GRANTED AUG. 31, 1965

ERRATA

Class	Patent No.
106-170	3,203,810
106-284	3,203,811
106-288	3,203,812
106-291	3,203,813
106-292	3,203,814
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106-294	3,203,816
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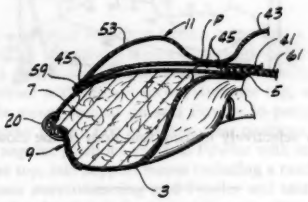
PATENTS

GRANTED AUGUST 31, 1982

GENERAL AND MECHANICAL

4,346,481
BASEBALL MITT
Roland N. Latina, Belleville, Ill., assignor to A-T-O Inc., Willoughby, Ohio
Filed Feb. 26, 1982, Ser. No. 238,364
Int. Cl.³ A41D *13/08*
U.S. Cl. 2—19 **10 Claims**



1. A baseball mitt comprising front and back plies forming a mitt body having a thumb portion, a finger portion and a portion connecting the thumb and finger portions, and glove means secured to the back of the body with the front of the glove means facing said back ply, said glove means having a thumb stall disposed generally behind the thumb portion of the mitt body, at least one finger stall disposed generally behind the finger portion of the body, a crotch portion between said thumb and finger stalls, a palm portion, and a hand-receiving opening adjacent the bottom of the mitt, said glove means being joined to the body of the mitt adjacent said hand-receiving opening and at the ends of said thumb and finger stalls, but being free of attachment to the mitt body at its said palm and crotch portions, thereby forming a pocket in the mitt between the front of the glove means and the back of the body having an opening through which padding or the like may be inserted into the pocket, and providing freedom of movement of the palm and crotch portions of the glove means relative to the body of the mitt for increasing the flexibility of the mitt.

4,346,482
LIVING CONTACT LENS
Jerald L. Tennant, 806 Greentree La., and Heinz J. Smirmaul, 1207 Spring Lake Dr., both of Duncanville, Tex. 75116
Filed Jan. 22, 1981, Ser. No. 227,255
Int. Cl.³ A61F *1/16, 1/24*
U.S. Cl. 3—13 **2 Claims**

1. A contact lens for insertion into the cornea of a patient comprising:

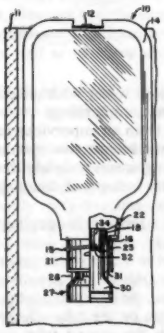
a circular portion of a donor cornea having an anterior surface and a posterior surface, said anterior surface being curved for correction of the patient's vision;

said circular portion posterior surface being ground to correspond to the curvature of the patient's eye; and

said circular portion having a depending axially posteriorly directed ring, said ring being integral with said posterior surface of said circular portion and having a height less than

the thickness of the patient's cornea for insertion into and retention by the patient's cornea.

4,346,483
FLOAT CONTROLLED LIQUID DISPENSER
Robert A. Rosen; Gayle F. Schuchmann, both of St. Louis, and James E. Pate, Winchester, all of Mo., assignors to Puro Corporation, St. Louis, Mo.
Filed Oct. 31, 1980, Ser. No. 202,701
Int. Cl.³ E03D *9/02, 9/03*
U.S. Cl. 4—227 **7 Claims**



1. A liquid dispensing apparatus for periodically discharging a measured quantity of liquid from a bottle necked container into a second liquid container comprising in combination (1) a thin walled cylindrical plug of resilient plastic material adapted to be force fitted into the bottle neck of the first container, the leading portion of said insert being inwardly tapered to facilitate insertion in said bottle neck, said plug insert having a tapered frustro conical protuberance extending interiorly and upwards from the tapered end of the plug insert and terminating part way in the cylindrical interior of said plug insert, the inner end of said protuberance having a planar annular surface perpendicular to the longitudinal axis of said insert plug and an orifice through said planar surface concentric with the axis of said insert plug and (2) a cylindrical two compartment plastic float member adapted for axial movement within the cylindrical portion and within the leading inwardly tapered portion of said plug insert, one compartment consisting of an air bell and the other compartment consisting of an annular frustro conical chamber dimensioned for spaced entry therein of the conical protuberance portion of said plug insert and for receiving liquid from the orifice in said plug insert, said chamber having in its base an annular planar valve seat coaxial with the annular planar surface in said plug insert, an integral guide stem axially extending from the base of the frustro conical chamber and slightly beyond the rim of said chamber, said guide stem being freely axially movable in the plug insert's orifice but retained therein by fingers radially projecting from the end of said

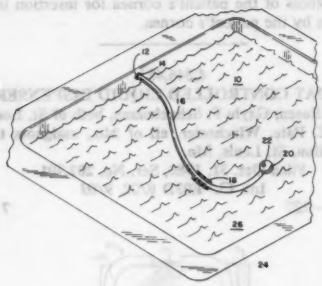
guide stem, and integral means on the exterior cylindrical surface of said plastic float member for spacing said float member from the interior cylindrical wall and the tapered end of the plug insert and for concentrically guiding the float's annular planar valve seat into a liquid sealing contact with the annular planar surface on said plug insert.

4,346,484

SWIMMING POOL INLET LOCATION CONTROL

John H. Martin, 1801-D Parkcourt Pl., Suite #104, Santa Ana, Calif. 92701

Filed Sep. 15, 1980, Ser. No. 187,617
Int. Cl.³ E04H *3/19, 3/18*
U.S. Cl. 4—507 **2 Claims**



1. A swimming pool water inlet selective variable location control retrofit device, comprising:

a tube fabricated from an impervious material such as polyvinylchloride and having two open ends;

removable coupling means coupling the first end of the tube in a substantially leak-proof coupling to a prior art pool return line water exit;

a float coupled in a removable coupling near the second end of the tube; and

a weight, coupled in a removable coupling near the second end of the tube, the weight negative buoyancy and coupling location on the tube and float positive buoyancy and coupling location on the tube selected so as to select the depth at which the second tube exit is retained in the water of the swimming pool.

4,346,485

APPARATUS AND METHOD FOR BATHING INVALIDS

Stewart D. Reed, El Toro, Calif.; Arthur A. Sills, Traverse City, Mich.; John H. Kraft, Traverse City, Mich.; Raymond T. Houle, Traverse City, Mich.; Michael A. Redwine, Acme, Mich., and Frederick A. Kilbourn, Suttons Bay, Mich., assignors to Silchor, Traverse City, Mich.

Filed Sep. 15, 1980, Ser. No. 187,522
Int. Cl.³ A47K *3/02*
U.S. Cl. 4—555 **17 Claims**

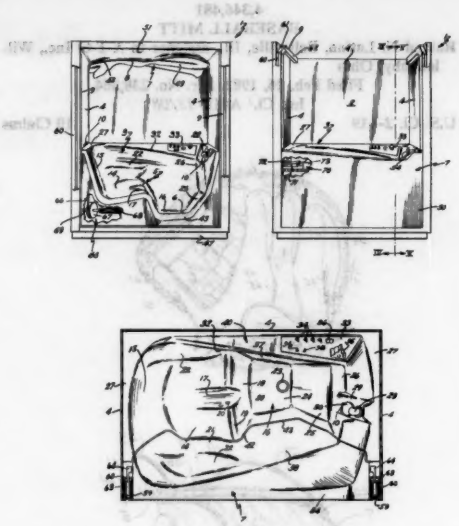
1. A bathing apparatus for invalids, comprising:

a bathtub having a lateral opening in a side thereof with sufficient size to permit invalid ingress and egress therethrough; said lateral opening being defined by a lip, and having a generally wedge-shaped contour which opens upwardly;

a door selectively closing said opening, and having a sealing edge with a generally wedge shape which conforms with the contour of said lip;

a compression seal connected with one of said lips and said door sealing edge;

means for vertically translating said door between an open position wherein invalid movement through said opening is permitted, and a closed position wherein said door and said bathtub are converged to compress said seal between said lip and said door sealing edge and form a seal therebetween which is leakproof when said bathtub is filled with water to a level substantially above a base portion of said lip for immersal bathing of an invalid; and



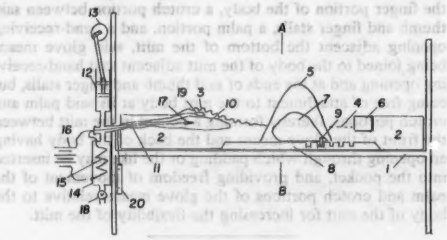
means for selectively locking said door in the closed position.

4,346,486

TRANQUILIZING BED

Dorothy V. Keller, 1767 Belvedere Rd., Port Deposit, Md. 21904

Filed Aug. 23, 1979, Ser. No. 68,917
Int. Cl.³ A61G *7/06;* A47D *9/02;* A47C *21/04*
U.S. Cl. 5—447 **4 Claims**



1. A mattress designed to comfort and tranquillize an occupant in the prone position having the following features;

a head and chest support surface having a convexity,

leg support surfaces somewhat lower than the head and chest support surface,

movable support means, located under the head and chest support surface serving to cause a rhythmic rising and falling motion of said surface,

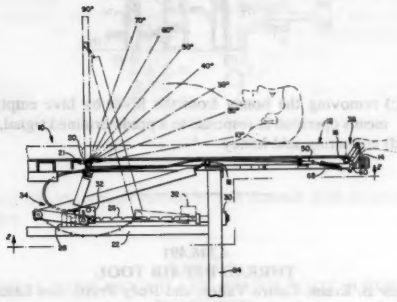
a motor driven reciprocating driving means connected to said movable support means,

a relatively narrow, removable elevation at the longitudinal centerline of said mattress adjustably mounted between the leg support surfaces on a guide bar placed longitudinally at the bottom of the mattress.

4,346,487
QUICK RELEASE MANUAL TYPE FOWLER FOR HOSPITAL STRETCHERS

Donald H. Holdt, and Donald B. Morgan, both of Cambridge, Md., assignors to Whittaker Medical Manufacturing Company, Richmond, Va.

Filed Apr. 25, 1980, Ser. No. 143,557
Int. Cl.[3] A47C 20/04; A61G 7/00, 1/02
U.S. Cl. 5—74 R 17 Claims

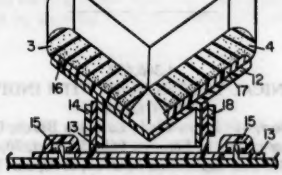


1. In a hospital stretcher having a top and a Fowler, the combination comprising means to support said Fowler at any one of a plurality of predetermined fixed angular positions of said Fowler with respect to the stretcher top, and manually operable means located on said Fowler to permit motion of said Fowler from a first of said angular positions to any other of said angular positions and said Fowler with respect to said stretcher top, said support means including a ratchet bar, linkage means interconnecting said Fowler and said ratchet bar, said ratchet bar being formed with a plurality of slots each corresponding to one of said plurality of fixed angular positions, pin means at the ratchet bar end of said linkage means cooperable with any one of said slots, and said manually operable means comprising means to release said pin means from said ratchet bar slot to permit said motion of said Fowler, said combination also including a traveling assembly which includes said pin means mounted on said ratchet bar for sliding motion longitudinally of said bar, said assembly comprising a pair of plates mounted one on each side of said ratchet bar, means to mount said pin on said plates, and spring means to bias said plates in a direction so as to normally urge said pin towards said ratchet bar slots.

4,346,488
ADJUSTABLE UPPER BODY REST

George D. Eary, Sr., 8 N. Woodlawn Ave., La Vale, Md. 21502

Filed Aug. 13, 1979, Ser. No. 65,761
Int. Cl.[3] A47G 9/00
U.S. Cl. 5—436 6 Claims



1. An adjustable rest for the head and shoulder portion of the human body in a predetermined position and comprising:

a. a base member,

b. a pair of laterally spaced apart resilient shoulder support members adapted to support the shoulders of said human body in a predetermined position,

c. each of said shoulder members being so attached to allow limited lateral and longitudinal movement relative to the base and allow complete removeability from the said base,

d. each of said shoulder members being so attached to allow limited rotational movement around a vertical axis, and to allow limited rotational movement around a horizontal axis, whereby said shoulder support members can be positioned on support members to provide a higher elevation head rest,

e. means to secure each of said shoulder members to the base in an immovable manner at any one of many desired positions,

f. a forehead support member having separate interconnected movable members comprising at least one element supporting the forehead, configured as a "V" tilted towards the user's face when the user is in a face down position, and providing support for the human forehead at varying degrees between the vertical and horizontal positions to the right or left side,

g. said forehead support member being movable laterally and longitudinally in a limited manner relative to the base and to a lower face rest, providing means to vary the distance between and to align the lower face member with the forehead support member,

h. said forehead support member being rotatable in a limited manner about vertical and horizontal axes,

i. means provided to secure said forehead rest in the desired lateral, longitudinal and rotational position in an immovable manner as well as to allow complete removability from the base,

j. means provided to adjust the elevation of the forehead supporting member at either end only or at both ends simultaneously,

k. a lower face rest, rotatable about a horizontal axis, perpendicular to said forehead supporting member in a limited manner, providing a slightly concave central support area at an approximately forty-five degree angle relative to the base member, rising upward to the right when user's head is to the left and rising upward to the left when the user's head is to the right,

l. said lower face rest having its extremities unsupported, thereby allowing means to configure to the user's lower face when the face is turned to the right or the left,

m. lower face rest stops, one at the right and one at the left providing a variety of locations for the lower face rest to the right or left allowing additional alignment capabilities to the forehead support member,

n. a correlation capability of the position of at least one movable member as related to a mating member being provided by an index point on one member and reference numbers on the mating member,

o. a higher elevation suitable for the support of the user's head and arm while lying on the right or left side being provided by the softer bottoms of two hinged shoulder members which are turned bottom-up,

p. a support so designed to prevent side slippage or tilt of the shoulder member being provided at each end of each shoulder member for use while located in the bottom-up position with the shoulder member running downward toward the user's body.

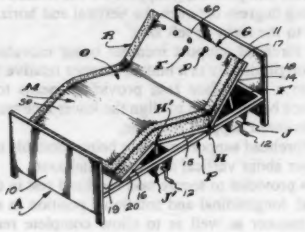
4,346,489
FOLDABLE WATERBED

James P. McMullan, 12300 Monarch St., Garden Grove, Calif. 92641

Filed Jun. 3, 1980, Ser. No. 155,963
Int. Cl.[3] A47C 27/08
U.S. Cl. 5—451 8 Claims

1. In combination, an articulated bed structure including an elongate normally flat horizontal sectional mattress supporting frame, including longitudinally spaced mattress supporting

sections, adjacent sections of the frame having transversely extending opposing edges, hinge means pivotally coupling the adjacent edge portions of adjacent sections of the frame together and jack mechanisms carried by the bed structure and coupled with certain of said sections to selectively pivot those sections upwardly and downwardly relative to their pivotally related sections, an elongate normally flat horizontal flotation mattress overlying the frame and in supported engagement with the sections, said mattress including an outer jacket of supple, flexible air and waterproof sheet plastic having normally horizontal substantially flat vertically spaced top and bottom walls and vertical side and end walls and a plurality of elongate bladders of supple, flexible and waterproof sheet plastic with top, bottom, side and end walls arranged within the jacket in parallel side-by-side relationship with each other and slackly filled with water, the dimensions of the related and



assembled bladders being substantially the same as the dimensions of the jacket whereby the bladders are captively retained in assembled relationship and are reinforced by the jacket, against over inflation and distension when selected portions of the mattress are elevated above other portions thereof, a retainer to retain the mattress atop the frame, said retainer including an elongate rectangular flexible panel substantially coextensive with the frame and arranged between the bottom wall of the mattress and the frame sections and a rectangular weir of soft flexible and vertically bendable material about the perimeter of the panel and projecting upwardly about and engaging the side and end walls of the jacket, sufficient air being evacuated from within the jacket whereby the walls of the jacket establish substantial uniform contact with related opposing walls of the bladders, said jacket further including partitions extending between adjacent bladders and extending between the top and bottom walls of the jacket.

4,346,490

METHOD AND APPARATUS FOR PRODUCTION OF HONEY

Jerome Katz, and Sidney J. Fogel, both of Rochester, N.Y.

Continuation-in-part of Ser. No. 115,615, Jan. 28, 1980, which is a continuation-in-part of Ser. No. 769,291, Feb. 22, 1977, Pat. No. 4,186,060, and Ser. No. 787,832, Apr. 18, 1977, Pat. No. 4,186,058. This application Jan. 12, 1981, Ser. No. 224,071

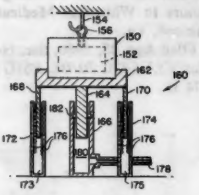
Int. Cl.³ A01K *59/00*

U.S. Cl. 6—1 **12 Claims**

2. A method for the production and collection of large amounts of honey comprising the steps of:

(a) providing an environment controlled structure in which vegetation, bee hives, and bees are maintained under optimum conditions for the production of honey and its accumulation in the hives;

(b) sensing the quantity of honey in the hives from outside said structure to produce signals related to the quantity of honey in the hives;



(c) removing the honey from the hives by hive emptying means operated in response to a predetermined signal; and

(d) collecting said honey.

4,346,491

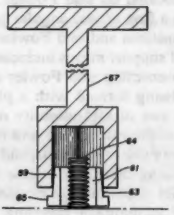
THREAD REPAIR TOOL

Roger B. Kraus, Castro Valley, and Rudy Pretti, San Leandro, both of Calif., assignors to Rethread, Inc., Castro Valley, Calif.

Filed Nov. 13, 1979, Ser. No. 93,289

Int. Cl.³ B23G *7/02*

U.S. Cl. 10—111 **13 Claims**



9. A thread repair tool, comprising:

a plurality of threaded nut sections having complementary threads forming a spiral thread when assembled about a stud or bolt to be worked on, the threads of each nut section presenting an advancing or lead edge at a predetermined angle with the normal to a stud or the like to be treated, and with the free end of said lead edge trailing, such that when said nut sections are assembled about a stud or the like to be treated, and then rotated, said lead edges apply a compressive thread reforming pressure to damaged thread material in its path to reshape damaged threads.

4,346,492

MECHANICAL TOOTHBRUSH WITH INDIVIDUAL TUFT DRIVE

Terry S. Solow, 410 Playa Blvd., La Selva Beach, Calif. 95076

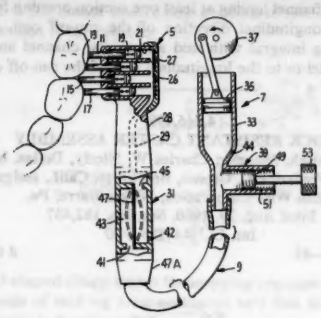
Continuation-in-part of Ser. No. 965,055, Nov. 30, 1978, Pat. No. 4,224,710. This application Mar. 10, 1980, Ser. No. 128,629

Int. Cl.³ A46B *13/02*

U.S. Cl. 15—22 R **8 Claims**

1. A mechanical brush having a head with a plurality of tufts in said head, wherein each tuft is attached to an individual piston and said pistons are each mounted for individual recip-

rocating motion within said head, and means for powering said reciprocating motion internally within said head, independent



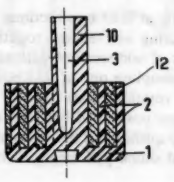
of any tuft movement caused by tuft contact with an external object.

4,346,493

DENTAL-CARE DEVICE AND BRUSH BODY SUITABLE THEREFOR

Johan H. Goudsmit, Rijnsburgerweg 48, 2333 AB Leiden, Netherlands

Filed Oct. 4, 1979, Ser. No. 81,921
Claims priority, application Netherlands, Oct. 10, 1978, 7810204
Int. Cl.³ B08B *1/00*; A46B *9/04*
U.S. Cl. 15—104.93 8 Claims



8. A dental care device for insertion entirely within the mouth of a human for effecting a cleaning action by bristles on tooth surfaces by chewing comprising:

(a) a chewable brush of non-edible pliable, resilient material

(b) said brush comprising:

(i) a single support body,

(ii) bristles extending from a surface of said support body only substantially in the same direction, and

(iii) a pliable and resilient projection extending from said surface of said support body, substantially in the same direction as said bristles,

(c) said brush having such dimensions that it can be inserted entirely into the human mouth and manipulated within the mouth by chewing upon the pliable and resilient projection.

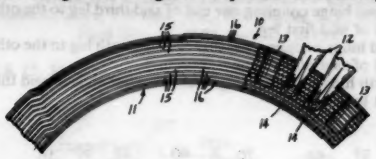
4,346,494

BRUSH STRUCTURE

Ralph C. Peabody, and Bertil J. Sundberg, both of Minnespolis, Minn., assignors to Tennant Company, Minneapolis, Minn.

Filed Feb. 17, 1981, Ser. No. 234,672
Int. Cl.³ A46B *3/16, 9/08*
U.S. Cl. 15—179 21 Claims

7. A bristle brush comprising alternating layers of plastic and fiber sheet material, the language said brush including a plurality of plastic layers and a plurality of fiber layers, the innermost layer and the outermost layer both being plastic layers, said layers being secured together to provide a bristle support, a



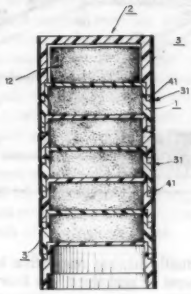
plurality of cavities in said bristle support, and a plurality of bristles held in each of said cavities.

4,346,495

SEGMENTAL BRUSHING EQUIPMENT

Chung S. Lin, 46 Alley 21, Lane 99, Pei-Yuan St., Tainan, Taiwan

Filed Dec. 27, 1979, Ser. No. 107,539
Int. Cl.³ A46B *5/00*; B65D *21/00*
U.S. Cl. 15—184 1 Claim



1. A segmented brush device comprising: a plurality of brush units sequentially coupled together in an end-to-end manner to form a cylindrical column, wherein an annular slot is formed between adjacent brush units; a cover for covering the first of said brush units; a sealing coat completely surrounding said brush units and said cover, said sealing coat having depressions therein, said depressions partially extending into said annular slots wherein:

a rear end of each said brush unit includes a female portion and a front end of each said brush unit includes a male portion, said male portion being longer than said female portion in the axial direction thereof and wherein the male portion of said brush units if fitted into the female portion of an adjacent brush unit for sequentially coupling said units and said slot is formed therebetween, the width of said slot being equal to the difference in length between said male portion and said female portion.

4,346,496

FOLDABLE IMPLEMENT

Michael L. Murray, P.O. Box 223, Ft. Collins, Colo. 80522

Filed Jun. 8, 1981, Ser. No. 271,782
Int. Cl.³ A46B *7/00, 9/02*
U.S. Cl. 15—185 11 Claims

1. An implement comprising:

first and second elongated legs joined by a first hinge between respective one ends thereof to permit said legs to be moved toward and away from one another around said hinge, said legs being mutually shaped to define a cavity when folded together about said hinge;

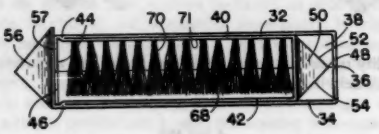
third and fourth elongated legs each of a size to nest within

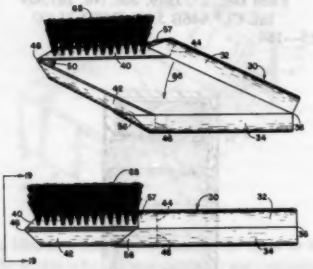
the portion of said cavity defined by a respective one of said first and second legs;

a second hinge coupling one end of said third leg to the other end of said first leg;

a third hinge coupling one end of said fourth leg to the other end of said second leg;

a fourth hinge coupling together the other ends of said third and fourth legs;





said legs individually having respective lengths permitting toggle movement of said third and fourth legs between a first stable position concealed within said cavity and a second position in which they project generally away collinearly from said cavity and said first and second legs when the latter are moved together;

and work means defined on at least one of third and fourth legs for performing a task when they so project away from said cavity.

4,346,497

DEVICE FOR REMOVING DUST FROM A WINDING MACHINE

Joachim Rohner, Monchen-Gladbach, and Edmund Wey, Nettetal, both of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed May 14, 1980, Ser. No. 149,704

Claims priority, application Fed. Rep. of Germany, May 16, 1979, 2919768

Int. Cl.³ A47L *5/38*

U.S. Cl. 15—301 **9 Claims**

1. Device for removing dust from a winding machine, comprising an air suction channel disposed alongside and adjacent to a run-off coil having thread being unwound therefrom, said air suction channel having at least one suction opening formed therein in longitudinal direction of the run-off coil, and a trough being integral with said air suction channel and disposed parallel to to the longitudinal axis of the run-off coil.

4,346,498

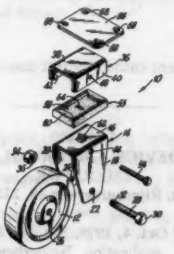
SHOCK RESISTANT CASTER ASSEMBLY

John H. Welsch, Moscow; Charles W. Nicely, Dallas, both of Pa., and Frederick C. Greene, Bellflower, Calif., assignors to Metropolitan Wire Corporation, Wilkes-Barre, Pa.

Filed Aug. 29, 1980, Ser. No. 182,437

Int. Cl.³ A47B *91/00*

U.S. Cl. 16—44 **8 Claims**



1. A caster assembly comprising:

a wheel having an opening therethrough to define a rotational axis;

a housing having at least two sections;

first means securing said sections together to permit vertical displacement of said sections with respect to each other;

second means coupling one of said housing sections to said wheel at the rotational axis thereof;

shock pad means positioned between said housing sections for resiliently cushioning the vertical displacement therebetween, said shock pad means including an elastomeric member;

said first means including a rivet disposed between said housing sections for limiting the vertical displacement between said sections, said rivet passing through elongated slots provided in one of said sections and holes provided in the other section to further permit pivotal movement thereabout between said sections;

said housing including a yoke assembly having upper and lower sections, said second means including a bolt for rotatingly coupling said wheel to said lower section;

connection means coupled to said upper section for connection of the caster assembly to a mobile device; and

said lower section including an inverted U-shaped yoke member having a bight portion and downwardly depending legs, said bolt coupling said legs to said wheel, said upper section including a cap member spaced above said bight portion, and said elastomeric member being resiliently sandwiched between said cap member and said bight portion.

4,346,499

DEVICE FOR SKINNING SMALL ANIMALS

Leroy Young, 969 Washington St., Franklinton, La. 70438

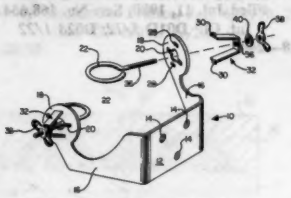
Filed Feb. 17, 1981, Ser. No. 234,652

Int. Cl.³ A22B *1/00*

U.S. Cl. 17—44.3 **10 Claims**

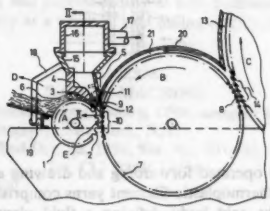
1. A device for holding a small animal in position to be skinned, which device comprises:

a. bracket means having leg means extending outwardly therefrom;
b. first slot means located near the ends of said leg means for receipt of an eyebolt;



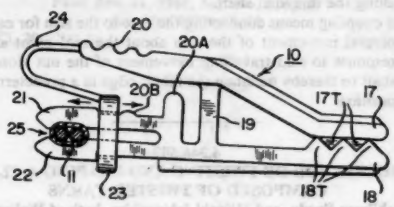
c. U-shaped clamp means for snapping engagement with said ends of said leg means adjacent said first slot means for receipt of said eyebolt; and
d. nut means for threading onto the ends of said eyebolt.

4,346,500
SPINNING PREPARATORY MACHINE
Robert Demuth, Wallisellen, Switzerland, assignor to Rieter Machine Works Ltd., Winterthur, Switzerland
Filed Jun. 16, 1980, Ser. No. 159,669
Claims priority, application Switzerland, Jul. 4, 1979, 6407/79
Int. Cl.³ D01G *15/40, 15/76*
U.S. Cl. 19—105 **6 Claims**



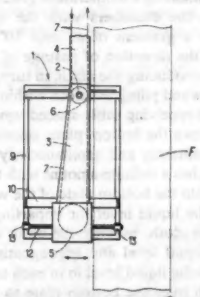
1. A spinning preparatory machine, especially a card, comprising:
a feeder roll;
means defining a feeder trough operatively associated with said feeder roll for receiving fibre material therebetween which has been infed between said feeder roll and said feeder trough;
a loosening roll provided with tip means;
said loosening roll and feeder roll coacting with one another so as to define therebetween a loosening zone for the fiber material;
a suction device located in a converging space formed between an inbound surface of the loosening roll and a surface of the feeder roll;
the feeder roll having a predetermined direction of rotation;
said loosening roll having a predetermined direction of rotation;
said predetermined direction of rotation of said feeder roll and said predetermined direction of rotation of said loosening roll being in the same rotational sense at the region of said converging space;
said means defining said feeder trough including a feeder trough body;
said suction device having a suction opening; and
said feeder trough body and said suction opening extending into the converging space up to the region of said loosening zone.

4,346,501
HEADSET CABLE STRAIN RELIEF CLAMP
Robert F. Saiya, 770 Park Ave., Huntington, N.Y. 11743
Filed May 21, 1980, Ser. No. 151,917
Int. Cl.³ A44B *21/00*
U.S. Cl. 24—329 **4 Claims**



1. A strain relief clamp for adjustably securing to a user's wearing apparel a signal cable dependent from a communications headset, said clamp including a unitary integrally molded plastic structure having a pair of toothed jaws joined by a hingeless jaw closure support member, one of said jaws including a lever arm extension for manually opening said jaws to adjustably clamp secure the strain relief clamp to the user's wearing apparel; said integrally molded plastic structure further including a pair of spaced yieldable clamp arms defining a retainer slot for receiving and adjustably clamp securing the unitary strain relief clamp to the signal cable, each of said toothed jaws having a set of apparel gripping teeth aligned in a row, each of said rows being spaced from the row of the opposing jaw, the teeth of said rows being so constructed and oriented along said rows as to be non-overlapping with respect to the row of teeth of the opposing jaw.

4,346,502
TENTER ARM SWINGING APPARATUS
Hideyuki Cho, c/o Toyo Machinery Co. Ltd., No. 29-6, Zuikodori, Higashiyodogawa-ku, Osaka-shi, Japan
Filed Sep. 24, 1980, Ser. No. 190,405
Claims priority, application Japan, Oct. 1, 1979, 54-136389[U]
Int. Cl.³ D06C *3/02*
U.S. Cl. 26—76 **3 Claims**



1. A tenter arm swinging apparatus, comprising:
a frame,
an arm having means for engaging the edge of a fabric, said arm being mounted on the frame for pivotal movement about a pivot axis which extends perpendicularly to the plane of the fabric,
a threaded shaft fixedly mounted on the frame so as to be prevented from rotating relative thereto,
a case,

a nut rotatably disposed in the case and threadedly engaging the threaded shaft, a reversible motor responsive to lateral deviation of the fabric edge also mounted in said case, and a transmission means also mounted in the case for conveying shaft rotation of the motor to rotary motion of the nut, thereby causing travelling movement of the nut and case along the threaded shaft,

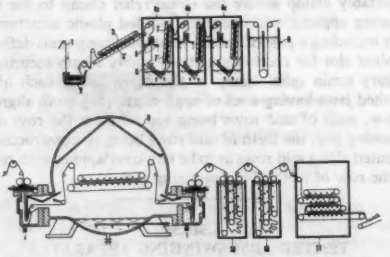
and coupling means connecting the case to the arm for causing pivotal movement of the arm about the said pivot axis in response to said travelling movement of the nut along the shaft to thereby maintain the fabric edge in a predetermined position.

4,346,503

PROCESS FOR DE-TWISTING AND CRAPING A CLOTH COMPOSED OF TWISTED YARNS

Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan

Filed Dec. 4, 1979, Ser. No. 100,265
Claims priority, application Japan, Dec. 20, 1978, 53-157149
Int. Cl.[3] D06B *3/10*
U.S. Cl. 28—155 1 Claim



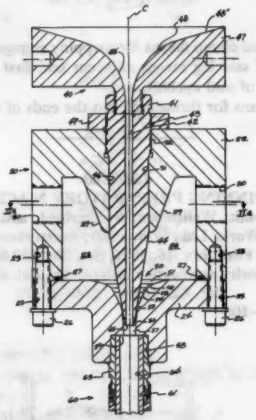
1. A process for de-twisting and craping a cloth composed of twisted yarns, comprising transporting a cloth continuously and serially through at least three vertically extending wet-heat treating chambers so that the cloth passes, in turn, through each of the at least three chambers, providing a liquid level in the lower part of each chamber with a bottom plate located in each chamber partly above and partly below the liquid level therein, maintaining a temperature gradient from 70° C. to 100° C. between the chambers with the temperature increasing stepwise by a gradient of at least 10° C. from chamber to chamber in the direction of passage of the cloth through the chambers, introducing the cloth, in turn, into each of the treating chambers and piling the cloth within each treating chamber onto a cloth-receiving table spaced upwardly from the liquid level and above the bottom plate, opening the cloth receiving tables intermittently and spontaneously when the cloth piled thereon reaches a definite amount with the cloth falling due to its weight onto the bottom plate of the wet-heat treating chamber above the liquid level for imparting beating and rubbing forces to the cloth, moving the cloth over the bottom plate below the liquid level and impregnating the cloth with hot water below the liquid level in in each treating chamber, moving the cloth over the bottom plate to above the liquid level and, above the liquid level, passing the cloth upwardly in each treating chamber through a narrow passage and jetting steam into the passage from opposite sides thereof for beating and rubbing the cloth, removing the cloth from the last one of the treating chambers and cooling the cloth to about 40° C. and thereby de-twisting the yarn of the cloth for craping the cloth successively due to the effect of the swelling of the cloth as well as the beating and rubbing forces applied to the cloth in each of the wet-heat treating chambers.

4,346,504

YARN FORWARDING AND DRAWING APPARATUS

Manfred O. Birk, Spartanburg; Wolfgang A. Pieszczek, Inman, and Brian E. Little, Spartanburg, all of S.C., assignors to Hoechst Fibers Industries, Spartanburg, S.C.

Filed Jul. 11, 1980, Ser. No. 168,654
Int. Cl.[3] D01D *5/12*; D02J *1/22*
U.S. Cl. 28—240 40 Claims



1. A fluid operated forwarding and drawing apparatus for continuous thermoplastic filament yarns comprising:

(a) a body, said body defining a fluid plenum chamber therein, said body further defining fluid inlet ports and a generally funnel shaped outlet port in communication with said plenum chamber and a bore opening in communication with said plenum chamber and located concentric to a central axis through said fluid outlet port;

(b) yarn guide means received in said bore opening and terminating in said generally funnel shaped fluid outlet port of said plenum chamber, said guide means defining a yarn passageway therethrough, said passageway being concentric to said central axis, a portion of the length of said guide means having a generally frustoconical taper to a forward tip of said means, said frustoconically tapered portion of said means cooperating with said generally funnel shaped fluid outlet port to define a nozzle structure having a fluid acceleration zone, a throat, and a diverging expansion zone, and said outlet port further defining a converging fluid transition zone beyond the tip of said yarn guide means; and

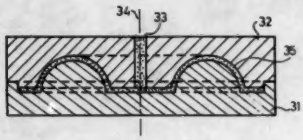
(c) an elongated tubular element located at an outer end of said converging transition zone and defining a yarn passageway of constant diameter therethrough, the diameter of said elongated tubular element being greater than the diameter of the transition zone at the exit from same, said yarn passageway abutting said outlet end of said transition zone, whereby filaments of a filament bundle are forwarded and drawn by said apparatus while avoiding any significant entanglement in said elongated tubular element or significant contact with walls defining same.

4,346,505

METHOD OF FABRICATING PIEZOELECTRIC TRANSDUCER WITH POLYMER ELEMENT

Claire Lemonon, and Francois Micheron, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 31, 1979, Ser. No. 108,706
Claims priority, application France, Jan. 4, 1979, 79 00200
Int. Cl.³ H01L *41/22*
U.S. Cl. 29—25.35 8 Claims



1. A method of fabricating the active element of polymer material for a piezoelectric transducer, the principal faces of said active element being in the form of non-developable surfaces and said polymer material building up between said principal faces a self-supporting shell, said method comprising the steps of:

(1) shaping said polymer material in the form of said shell using shaping means while preserving the mechanical isotropy of said polymer material;

(2) coating said shell along said principal faces with first and second electrodes facing one another; and thereafter

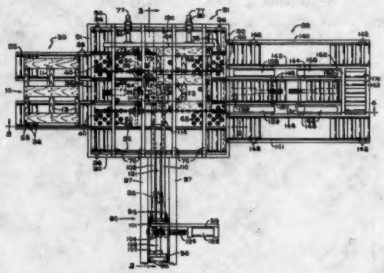
(3) applying across said electrodes a polarization voltage for subjecting said polymer material to a poling electric field oriented along the normal to said principal faces thereby endowing said polymer material with piezoelectric properties solely as a result of said poling electric field.

4,346,506

PALLET MACHINE

Troy E. Martindale, Reynoldsburg, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Oct. 28, 1980, Ser. No. 201,653
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—239 8 Claims



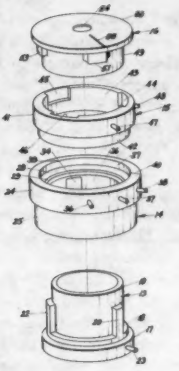
1. An apparatus for the disassembling and repairing of nailed wooden pallets, said apparatus having a support frame, a carriage mounted on one side of said support frame, said carriage having a pair of longitudinally extending supports for movement therewith, said supports having outboard ends, nail cutting means mounted on said outboard ends of said supports, said nail cutting means being flat rotary disks lying generally in a horizontal plane, drive means connected to said carriage for advancing and retracting said carriage to and from said support frame, inverting means mounted on said carriage and connected to said carriage supports for rotating said carriage supports and their cutting means selectively 180° to align said cutting means with the juncture of the upper or lower deckboards with a stringer in said pallet, and lock means for securing said pallets on said support frame.

4,346,507

PIN-BACK BUTTON MACHINE

Oran H. Heuck, P.O. Box 68053, Indianapolis, Ind. 46268

Filed Jan. 21, 1981, Ser. No. 226,851
Int. Cl.³ B23P *11/00*
U.S. Cl. 29—243.52 21 Claims



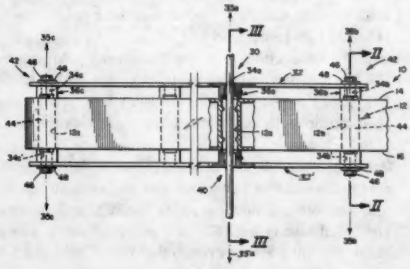
1. A die assembly for the making of pin-back buttons of the type comprising a button back, a button shell, art work and a protective cover, said die assembly comprising a base die part, a crimping die part, a ring die part and a top die part, said die parts being mountable one upon the other in the order given, cooperating means on said base die part and said crimping die part and on said ring die part and said top die part determine the depth to which said base die part enters said crimping die part and said top die part enters said ring die part, said die parts each being rotatable with respect to that die part on which it is mounted to bring selected ones of said cooperating means into and out of registry to enable each die part to perform its functions in proper sequence.

4,346,508

REBORING FIXTURE AND METHOD

David L. Baumann, Bartonville, and Richard A. Meismer, Metamora, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 30, 1980, Ser. No. 154,648
Int. Cl.³ B23D *19/10*
U.S. Cl. 29—402.18 6 Claims



1. A fixture (30) adapted to rebore a first workpiece bore

(12*a*) in a workpiece (10), said workpiece (10) having said first workpiece bore (12*a*) and also having second and third workpiece bores (12*b*,12*c*), said workpiece bores (12*a*,12*b*,12*c*) being spaced apart and extending between a one side (14) and an other side (16) of said workpiece (10), said fixture (30) comprising:

a one and an other rigid guide members (32,32') each having first, second and third guide member bores (34*a*,34*b*,34*c* and 34*a*',34*b*',34*c*') transversely extending therethrough and being spaced apart to correspond with said first, second and third workpiece bores (12*a*,12*b*,12*c*), said one and other guide members (32,32') of a construction sufficient for precisely positioning said first guide member bores (34*a*,34*a*') thereof into a predetermined relationship with said second and third workpiece bores (12*b*,12*c*), with said guide members (32,32') being along said one and other sides (14,16) respectively of said workpiece (10) and with said first, second and third guide member bores (34*a*,34*b*,34*c* and 34*a*',34*b*',34*c*') placed into a corresponding relationship with said first, second and third workpiece bores (12*a*,12*b*,12*c*) respectively;

means (42) for releasably connecting said guide members (32,32') together through said second and third workpiece bores (12*b*,12*c*) to hold said first guide member bores (34*a*,34*a*') in a predetermined relationship with said second and third workpiece bores (12*b*,12*c*) and in a generally coaxial relationship with said first workpiece bore (12*a*); and,

a one and an other pilot bushings (72,80), said one pilot bushing (72) adapted to be fitted within said first guide member bore (34*a*) of said one guide member (32), said other pilot bushing (80) adapted to be fitted within said first guide member bore (34*a*') of said other guide member (32').

4. A method for reboring a massive, longitudinally extending workpiece (10) with a one and an other sides (14,16), said workpiece (10) having spaced apart first, second and third workpiece bores (12*a*,12*b*,12*c*) transversely extending with respect to said workpiece (10) between said one and other sides (14,16), said first bore (12*a*) being relatively more worn with respect to the others (12*b*,12*c*), comprising the steps of:

fusing a quantity of a metal (92) is said first workpiece bore (12*a*) circumferentially along a surface (18*a*) thereof;

positioning a one and another rigid guide members (32,32') along said one and other sides (14,16) respectively of said workpiece (10), said one and other guide members (32,32') each having a first, second and third guide member bores (34*a*,34*b*,34*c* and 34*a*',34*b*',34*c*'), the positioning including placing said first, second and third guide member bores (34*a*,34*b*,34*c* and 34*a*',34*b*',34*c*') into a corresponding relationship with said first, second and third workpiece bores (12*a*,12*b*,12*c*) respectively;

releasably connecting said one and other guide members (32,32') together and with said workpiece (10) to hold said first guide member bores (34*a*,34*a*') in a predetermined relationship with said second and third workpiece bores (12*b*,12*c*); and,

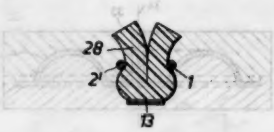
inserting at least one pilot bushing (72 or 80) into each of said first guide member bores (34*a* and 34*a*') of said respective one and other guide members (32,32'), and feeding an elongated boring bar (52) into said first workpiece bore (12*a*) and into a supported relationship with said pilot bushings (72,80), said boring bar (52) adapted to adjustably hold a cutting tool (56) in an outwardly protruding position.

4,346,509

PROCESS FOR THE INTRODUCTION OF A PIECE OF FOAM PLASTIC INTO A POCKET FITTED TO IT

Rene Tschan, Reinach, Switzerland, assignor to Lonza Ltd., Gampel, Switzerland

Filed Oct. 6, 1980, Ser. No. 194,220
Claims priority, application Switzerland, Aug. 22, 1980, 6341/80
Int. Cl.³ B23P *11/02*
U.S. Cl. 29—451 4 Claims



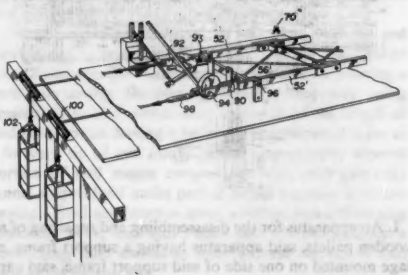
1. Process for the insertion of an elastically bendable platform-like piece made of foam plastic into a pocket, fitted to the piece of foam plastic, through a slit-like opening along much of an edge of the pocket, the periphery of the slit-like opening being shorter than the periphery of the cross section, perpendicular to the direction of insertion, of the piece of foam plastic, comprising bending the piece of foam plastic into the shape of an arc at first obliquely to the direction of insertion, compressing the piece bent thusly between two arms, which extend in the direction of insertion, the bent piece being approximately U-shaped in cross section, compressing further the bent piece of foam plastic until there is at least partial joining of the legs of the bent piece of foam plastic, pulling the pocket with its spread slit-like opening over the bent piece of foam material, which is compressed between the arms, moving apart the arms, and pulling the pocket together with the piece of foam plastic container therein off of the arms, the pocket being aligned with the piece of foam plastic in as far as the piece of foam plastic has not completely reassumed its original shape.

4,346,510

PRETENSIONING DIAGONALS IN LATTICE BEAM-COLUMNS

Leonard H. Stirling, Verona, Canada, assignor to Her Majesty the Queen, Ottawa, Canada

Filed Mar. 3, 1980, Ser. No. 126,998
Claims priority, application Canada, Mar. 29, 1979, 324563
Int. Cl.³ B21D *39/00*; E04C *3/10*
U.S. Cl. 29—452 6 Claims



1. A method of prestressing a structural member having a pair of spaced apart longitudinal elements, and a latticework made of a plurality of strut elements and diagonal members rigidly interconnected together by a plurality of joint connector means, said connector means also joining the latticework rigidly to the longitudinal elements, said method comprising the steps of

(a) interconnecting the strut elements and diagonal members rigidly together as said latticework, the latticework being freely movable relative to said longitudinal elements;

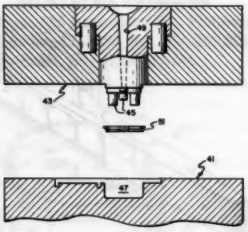
(b) applying a tensile load to said latticework only;
(c) securing said longitudinal elements rigidly to said latticework while said tensile load is being applied; and
(d) removing said tensile load whereby said structural member remains prestressed, with the diagonal members in tension, the strut elements in compression and the longitudinal elements in compression.

4,346,511

METHOD FOR PREPARING DOSIMETER FOR MEASURING SKIN DOSE

Donald E. Jones; DeRay Parker, and Paul R. Boren, all of Idaho Falls, Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 55,211, Jul. 5, 1979, Pat. No. 4,286,165. This application Jul. 2, 1980, Ser. No. 165,452
Int. Cl.³ B23P *3/00, 25/00;* B29B *3/00;* B29F *1/10*
U.S. Cl. 29—458 **10 Claims**



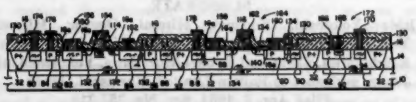
1. A method of forming personnel dosimeter holders having a plurality of windows communicating with a plurality of corresponding compartments for TLD phosphors within the front face thereof to provide uniform window thickness in corresponding windows of different holders comprising:
forming a die insert having at least one opening for receiving a window of plastic material;
affixing at least one window of plastic material within said die insert; and
positioning said die insert and window within a die shaped for injection molding of said dosimeter holder and injecting a thermoplastic material into said die around said die insert for forming said dosimeter holder with said insert embedded in the material of the holder and each of said compartments molded therein having a window therein at the front face of the holder.

4,346,512

INTEGRATED CIRCUIT MANUFACTURING METHOD

Victor K. C. Liang, San Jose; Bernard Bouyssounouse, Palo Alto, and Ernest W. Yim, Sunnyvale, all of Calif., assignors to Raytheon Company, Lexington, Mass.

Filed May 5, 1980, Ser. No. 146,548
Int. Cl.³ H01L *21/22*
U.S. Cl. 29—571 **8 Claims**



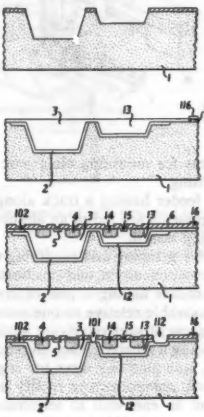
1. A method for forming a field effect transistor and a bipolar transistor in a semiconductor comprising the steps of:
(a) simultaneously forming source and drain contact regions of the field effect transistor and an emitter region of the bipolar transistor in the semiconductor with the same doping concentrations; and
(b) heating the semiconductor forming an insulating layer on a surface portion of the semiconductor disposed between the source and drain contact regions while preventing dopant in the source and drain contact regions from entering the surface portion of the semiconductor between the source and drain contact regions.

4,346,513

METHOD OF FABRICATING SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE UTILIZING SELECTIVE ETCHING AND EPITAXIAL REFILL

Junichi Nishizawa, Sendai, and Masafumi Shimbo, Tokyo, both of Japan, assignors to Zaidan Hojin Handotai Kenkyu Shinkokai and Kabushiki Kaisha Daini Seikosha, both of, Japan

Filed May 21, 1980, Ser. No. 152,024
Claims priority, application Japan, May 22, 1979, 54-63031
Int. Cl.³ H01L *21/205, 21/302*
U.S. Cl. 29—580 **5 Claims**



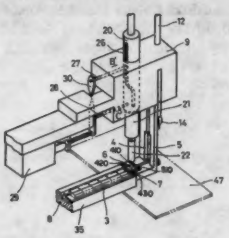
1. A method of fabricating a semiconductor integrated circuit device, comprising the steps of:
providing a semiconductor substrate having a main surface having a low-index crystallographic surface orientation substantially within ±0.2° of a selected one of the crystallographic orientations (111), (113) (112) and (110);
disposing a masking film on said semiconductor substrate main surface in a configuration to leave exposed portions of said semiconductor substrate main surface to be etched;
selectively etching said exposed portions of said semiconductor substrate main surface to form surface depressions in said semiconductor substrate main surface, wherein at least one of said surface depressions has a depth different from the others;
removing said masking film to expose said semiconductor substrate main surface including unetched portions thereof;
forming an epitaxial layer on said semiconductor substrate main surface from a Si—H—Cl system under conditions effective to achieve faster lateral growth than vertical growth so as to form the epitaxial layer with regions of three different thicknesses, first and second epitaxial layer regions of different thickness being formed at least partially filling said surface depressions of different depths, and a third epitaxial layer region of different thickness being formed overlying unetched portions of said semiconductor substrate main surface; and
forming additional regions of said semiconductor integrated circuit in said first and second epitaxial layer regions and

at least one of isolation regions and electrodes in said third epitaxial layer regions so as to complete said semiconductor integrated circuit.

4,346,514
APPARATUS FOR MOUNTING ELECTRONIC COMPONENTS

Yoshiaki Makizawa, Hirakata; Katsuyuki Yamamoto, Katano, and Kanji Hata, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 28, 1980, Ser. No. 125,657
Claims priority, application Japan, Mar. 5, 1979, 54-25806
Int. Cl.³ H05K 3/30
U.S. Cl. 29—740 6 Claims



1. An apparatus for mounting electronic components on a substrate comprising

a component feeder having a track along which said electronic components are fed in an aligned row into a position rectifying station,

chuck means for grasping and rectifying the position of the electronic components in said position rectifying station, said chuck means having a pair of arm pinching means which are movable relative to one another for defining a receiving recess at said rectifying station, said receiving recess including a receiving face aligned with said component feeder, side pinching faces for engaging the sides of said electronic components to rectify them in an accurate position, and an end wall to terminate feeding of electronic components into the receiving recess,

a vertically movable column having a mounting means at the lower end thereof for holding said electronic component by air suction, said mounting means being connected to a suction means,

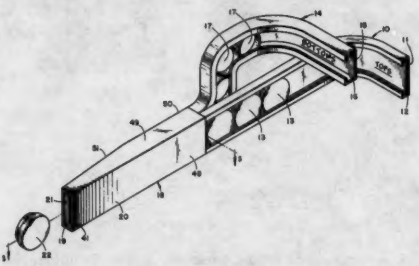
a driving means for driving said chuck means in relation to the vertical movement of said column in a manner that the pinching means is moved so as to form a first gap slightly wider than the width of said electronic component when receiving said electronic component on said receiving face, a second gap equal to the width of said electronic component when rectifying its position and a third gap which is sufficiently wide to allow said column to pass therethrough when placing said electronic component on said substrate.

4,346,515
TELESCOPIC MATING APPARATUS

William F. Lodding, Downers Grove, and John T. Murray, Oakbrook, both of Ill., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Apr. 11, 1980, Ser. No. 139,285
Int. Cl.³ B23P 19/04
U.S. Cl. 29—773 1 Claim

1. Apparatus for assembling top and bottom petri dish members each having an open end and a closed end with sides extending therebetween in vertical telescopic relation with the axis of said members extending horizontally comprising in combination first and second conveying means for separately conveying said top and bottom petri dish members respectively and an assembly unit, said first and second conveying means each having a rectangular C-shaped vertical cross-section with an upper groove and a lower groove along which said petri dish members are conveyed on their sides in a vertical position, said first and second conveying means being initially positioned for conveying said petri dish members in a vertical back-to-back relation with said open ends of said top and bottom petri dish members facing away from one another and wherein the second conveying means for the bottom petri dish members has a crossover portion for subsequently supplying said bottom members to the assembly unit in vertical face-to-face relation to said top members with said open ends of said top and bottom petri dish members directly facing one another, said assembly unit being tubular in shape with parallel top and bottom walls, first and second vertical sidewalls and an exit opening and wherein the second vertical sidewall angles toward the first vertical sidewall as the two sidewalls approach the exit opening, said first conveying means positioned so as to supply top petri dish members to the assembly unit adjacent to the first vertical sidewall and said second coveying means



positioned so as to supply bottom petri dish members to the assembly unit adjacent to the second vertical sidewall, said first and second conveying means and said assembly unit all being positioned so as to incline downward with respect to the horizontal so that said top and bottom petri dish members can roll on their sides in a vertical position along the conveying means and through the assembly unit, vertical means within said assembly unit for initially maintaining separation of said top and bottom petri dish members from each other as said bottom and top petri dish members enter said assembly unit, vertically actuated control means within said assembly unit for initially separately preventing movement of said top and bottom petri dish members therethrough and then subsequently separately permitting said top and bottom petri dish members to roll in a vertical position through said assembly unit, whereby said vertical bottom petri dish members abut against the angled portion of said second vertical sidewall and are pushed horizontally coaxially into a telescopic assembled relation with the vertical top petri dish members prior to the passage of such vertical top and bottom petri dish members from the exit opening of the assembly unit.

4,346,516
METHOD OF FORMING A CERAMIC CIRCUIT SUBSTRATE

Kishio Yokouchi, Koganei; Hiromi Ogawa; Hiromitsu Yokoyama, both of Yokohama; Nobuo Kamehara, Machida; Koichi Niwa, Tama, and Kyohei Murakawa, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 8, 1981, Ser. No. 252,214
Int. Cl.³ H05K 3/00, 3/36
U.S. Cl. 29—845 19 Claims

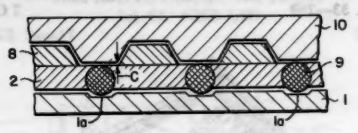
1. A method of forming a ceramic circuit substrate comprising the steps of:

(a) a mold setting process where a mold having many holes

larger than the outer diameter of conductive balls is positioned over a green sheet placed on a tray;

(b) a contact process where said green sheet and mold are placed in close contact;

(c) a filling process where the conductive balls are filled in the holes on said mold;



(d) a pressure embedding process where the conductive balls filled in the mold holes are embedded into the green sheet; and

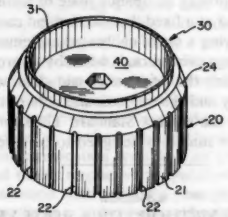
(e) a baking process where said green sheet is baked.

4,346,517

MUSTACHE TRIMMER

Robert A. Cianflone, 885 Lovingston Dr., Pittsburgh, Pa. 15216

Filed Oct. 15, 1980, Ser. No. 197,081
Int. Cl.³ B26B *21/00*
U.S. Cl. 30—49 **13 Claims**



1. A mustache trimmer comprising an annular holder having an inner cylindrical surface and a cylindrical razor blade telescoped into said holder adjacent said inner cylindrical surface of said holder, said blade having a circular cutting edge facing away from said holder along the axis of the annular holder, said cutting edge extending from said holder so as not to be obstructed from one axial end, said holder having a radial face preventing access to the razor blade from the other axial end, the outer edge of the holder nearest the cutting edge of the blade being beveled toward said cutting edge.

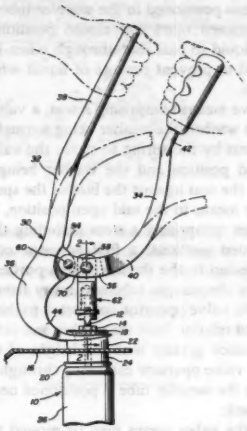
4,346,518

SHOCK ABSORBER REMOVING TOOL

David A. Wood, 9317 Southmoor Dr., Highland, Ind. 46322

Filed Nov. 21, 1980, Ser. No. 209,311
Int. Cl.³ B26B *17/02*
U.S. Cl. 30—272 R **9 Claims**

1. A shock absorber removing tool comprising first and second elongated levers, one end portion of said first lever including a laterally directed terminal end having a transversely widened terminus defining an abutment surface facing toward the other end of said first lever, said terminus having a slot formed therethrough opening outwardly at one end through a marginal portion of the abutment surface and closed at its other end, the closed end of said slot being generally centered relative to the plan area of said surface, said second elongated lever including a lateral projection at a first end thereof, means pivotally attaching the outer end portion of said projection to said one end portion of said first lever at a point spaced slightly from the terminal end for relative oscillation of said levers about an axis disposed transverse to planes in which said first lever and terminal end and second lever and projection are disposed and for swinging of the other and second ends of said first and second levers, respectively, toward and away from each other, an elongated thrust member pivotally attached at one end to said second lever adjacent the intersection of said projection with said second lever for oscillation relative to said second lever about an axis substantially paralleling the first mentioned axis and with the other end of said thrust member projecting toward said surface and shiftable toward and away from the latter responsive to movement of



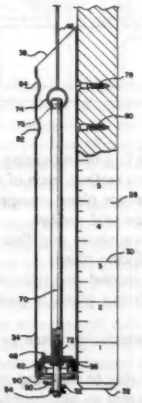
said other and second ends of said first and second levers away and toward each other, respectively, an end member carried by said other end of said thrust member and defining a pair of longitudinally spaced line segment wedge edges disposed transverse to the longitudinal extent of said thrust member and facing outwardly of said thrust member other end for engaging and splitting opposite radial portions of a shock absorber attaching nut backed by said abutment surface.

4,346,519

LIQUID LEVEL AND LIQUID CORING GAUGE

August Milo, 478 Schiller St., Elizabeth, N.J. 07206

Filed Sep. 2, 1980, Ser. No. 183,215
Int. Cl.³ G01F *23/04*
U.S. Cl. 33—126.4 R **4 Claims**



1. In a liquid gauge suitable for sampling the liquid contents

of a tank of the type including a top opening and a bottom, the combination of

gauge stick means of sufficient length to extend from the bottom of the tank through the top opening to measure liquid levels within the tank;

liquid sampling means affixed to the gauge stick means to remove a liquid sample from the tank,

the liquid sampling means comprising a hollow, elongate sample tube; and

valve means positioned in the sampler tube and being movable between open and closed positions to alternately allow liquid to pass therethrough when in the open position and to prevent passage of liquid when in the closed position,

the valve means comprising a seat, a valve stem, a spring and a washer, the washer being normally urged toward the seat by the spring to move the valve means to the closed position and the washer being movable away from the seat against the bias of the spring to move the valve means to the said open position, the valve means further comprising a stem including threaded and unthreaded portions, a first actuator comprising a rod connected to the threaded stem portion and extending within the sample tube and away from the seat and a remote valve operator connected to the first actuator in spaced relation from the washer and extending in length a distance greater than the height of the tank, the remote valve operator extending through the top opening when the sampler tube is positioned near the bottom of the tank;

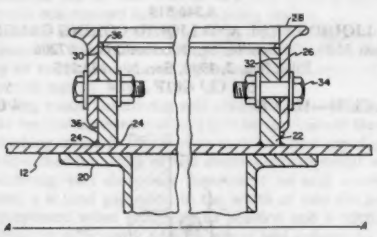
whereby the valve means may be moved to the said open position by pulling the remote valve operator from a position exteriorly of the tank.

4,346,520

ALINEMENT METHOD

Tom E. Moore, 6105 Brandon Ave., Springfield, Va. 22150

Filed Jan. 24, 1978, Ser. No. 871,861
Int. Cl.³ F41F *23/06*
U.S. Cl. 33—180 R 1 Claim



1. A method for aiding the mounting of any of a plurality of rotating elements on a surface, each of said elements requiring parallelism to a reference plane, comprising:

fixing a first ring on said surface,

fitting a second ring about said first ring, said second ring having an interfacing plane;

manipulating said second ring relative to said first ring such that said interfacing plane is parallel to said reference plane,

maintaining said interfacing plane parallel to said reference plane,

fixing said second ring to said first ring,

mounting said element on said interfacing, plane,

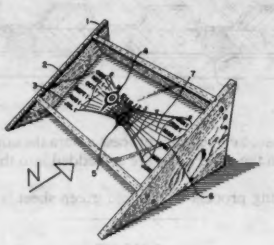
whereby each one of said plurality of elements is aligned with said reference plane as well as with each other.

4,346,521

MODERN SUNDIAL

Peter A. Luft, 1870 Sacramento #314, San Francisco, Calif. 94109

Filed Jan. 17, 1979, Ser. No. 4,172
Int. Cl.³ G04B *49/00*
U.S. Cl. 33—269 2 Claims



1. A sundial including a transparent plate of material adapted to face the sun, an opaque design printed on said transparent plate, and a dial, said opaque design functioning as the gnomon of the sundial, the shadow of which is cast onto the dial by the sun, said dial comprising an opaque plate of material which is held parallel to and at a fixed distance behind said transparent plate, said dial having a set of calibrated analemmae and solar declination markings printed on it whereby to provide a reference for determining the position of said shadow in order to tell the time of day and the approximate date of the year, said time of day being the correct Standard Time for the specific locale in which the sundial is designed to be used.

4,346,522

DEHYDRATING METHOD FOR A ROOT VEGETABLE AND THE LIKE

Sadao Nakagaki, Ueda, Japan, assignor to Yamajirushi Jozo Co., Ltd., Tokyo, Japan

Division of Ser. No. 93,945, Nov. 13, 1979, abandoned. This application Mar. 17, 1981, Ser. No. 244,540
Int. Cl.³ F26B *7/00*; A23B *4/04*
U.S. Cl. 34—12 3 Claims

1. A method for dehydrating a panax ginseng which comprises

(A) manually inserting a single needle into the panax ginseng a plurality of times in at least one of the crotch portions of the panax ginseng and the portions of the panax ginseng on which hair grows to improve dehydration of the interior of the panax ginseng,

(B) dehydrating the punctured panax ginseng, and

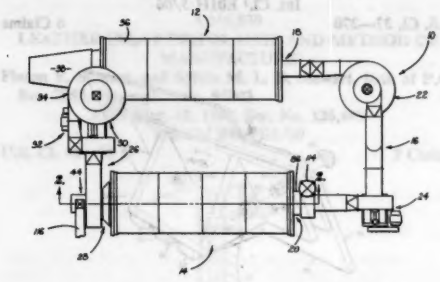
(C) spraying alcohol on the panax ginseng after dehydration has been completed to re-soften the panax ginseng which is hardened during the dehydration process.

4,346,523

METHOD AND APPARATUS FOR RECOVERING HEAT IN PRODUCT DEHYDRATION SYSTEM

Richard L. Ronning, Overland Park, Kans., assignor to Ronning Engineering Company Inc., Overland Park, Kans.

Filed Nov. 17, 1980, Ser. No. 207,216
Int. Cl.³ F26B 7/00
U.S. Cl. 34—17 7 Claims



1. A crop drying system, comprising:

a primary dryer having a direct heat exchange zone and structure operatively coupled and in communication with said zone including an air inlet, a crop inlet, and outlet-defining means for exhaust air and crop;

a predryer having an indirect heat exchange zone comprising means defining separate, adjacent, noncommunicating passages therethrough for crop and air respectively, an air inlet and an air outlet respectively operatively coupled and in communication with said air passage, and a crop inlet and outlet respectively operatively coupled and in communication with said crop passage;

means operatively coupled with said primary dryer air inlet for supplying initially hot, dry air thereto;

means operatively coupled with said predryer crop inlet for directing initially moist crop thereto;

crop moving means including conduit means operatively coupling said crop outlet of said predryer and said crop inlet of said primary dryer for passage of predried crop from said predryer to said primary dryer; and

air moving means including conduit means operatively coupling said air outlet-defining means of said primary dryer and said predryer air inlet, for passage of exhaust air from said primary dryer to said predryer in order to provide a source of heating air to said predryer.

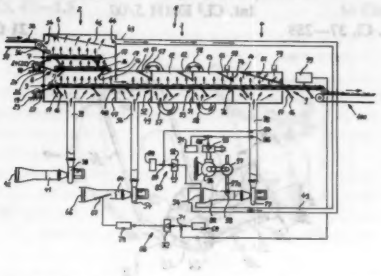
4,346,524

METHOD AND APPARATUS FOR CONDITIONING TOBACCO

Waldemar Wochnowski, and Reinhard Hohm, both of Hamburg, Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 922,575, Jul. 6, 1978, Pat. No. 4,241,515, which is a continuation of Ser. No. 448,949, Mar. 7, 1974, Pat. No. 4,143,471, which is a continuation-in-part of Ser. No. 220,599, Jan. 25, 1972, Pat. No. 3,799,176. This application May 9, 1979, Ser. No. 37,995
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1979, 2904308
Int. Cl.³ F26B 21/08
U.S. Cl. 34—26 24 Claims

1. A method of conditioning tobacco, comprising the steps of transporting a continuous stream of tobacco particles at a constant rate and in a predetermined direction along a predetermined path; measuring the initial moisture content of successive increments of the stream in a first portion of said path; increasing the moisture content of the particles in a second portion of said path downstream of said first portion, as considered in said direction, when the measured initial moisture content is below a predetermined value; drying the particles of said stream in a third portion of said path downstream of said second portion including subjecting the particles of tobacco to



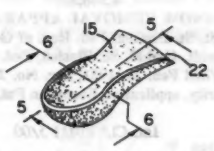
an adjustable heating action; measuring the final moisture content of successive increments of the stream of dried tobacco particles in a fourth portion of said path; and adjusting said heating action when the measured final moisture content deviates from a preselected moisture content.

4,346,525

CUSHION PAD FOR SPORT SHOES AND THE LIKE AND METHOD FOR FABRICATING SAME

John E. Larsen, Hingham, and Rob Roy McGregor, Concord, both of Mass., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 861,153, Dec. 16, 1977, abandoned. This application Nov. 6, 1979, Ser. No. 91,706
Int. Cl.³ A43B 23/08, 21/32, 19/00
U.S. Cl. 36—69 18 Claims

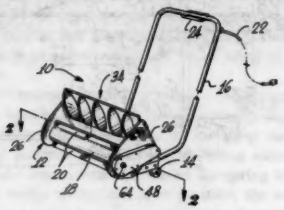


1. A cushion pad for shoes consisting essentially of a molded elastomeric compressible sheet of closed cell foam material adapted to support the calcaneus and the arch of a user's foot and having heel and arch portions of configuration conforming to the arch and heel portions of the foot being supported, said molded sheet having a forwardly extending leading edge for disposition in back of the first metatarsal joint when said cushion pad is in place in a shoe; said molded sheet having an inside edge portion which forms an upstanding arch support inside side wall extending from said leading edge; said molded sheet having an upstanding substantially vertical wall portion extending from said arch support side wall arcuately around the heel portion to an outer side thereof, said vertical wall gradually diminishing in height to merge with an outside edge portion of the molded sheet at a substantial distance from said beginning leading edge, said arch support side wall having a relatively higher vertical dimension than said upstanding substantially vertical wall portion extending from said arch support.

4,346,526
SNOW THROWER

Charles A. Mattson, Woodland Hills, and James J. Michel, Agoura, both of Calif., assignors to Allegretti & Company, Chatsworth, Calif.

Filed Apr. 3, 1980, Ser. No. 136,892
Int. Cl.³ E01H 5/00
U.S. Cl. 37—259 21 Claims

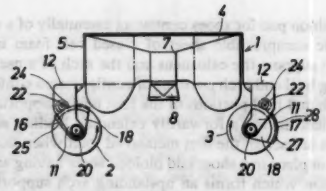


1. A snow thrower, comprising:
a housing;
means carried by said housing for picking up snow, and for throwing the snow generally upwardly from said housing;
deflector means carried for rotation with respect to said housing, and including a plurality of first deflector vanes rotatable to a position for deflecting thrown snow to one side of said housing, and a plurality of second deflector vanes rotatable to a position for deflecting thrown snow to the other side of said housing; and
locking means for locking said deflector means in a first rotatable position with said plurality of first deflector vanes in deflecting communication with the thrown snow and said plurality of second deflector vanes out of deflecting communication with the thrown snow, and a second rotatable position with said plurality of second deflector vanes in deflecting communication with the thrown snow and said plurality of first deflector vanes out of deflecting communication with the thrown snow.

4,346,527
SNOW REMOVAL APPARATUS

Alfred Schmidt, St. Blasien, Fed. Rep. of Germany, assignor to Alfred Schmidt, GmbH, St. Blasien, Fed. Rep. of Germany

Filed Feb. 25, 1981, Ser. No. 237,993
Claims priority, application European Pat. Off., Jul. 18, 1980, 80104230
Int. Cl.³ E01H 5/00
U.S. Cl. 37—250 9 Claims

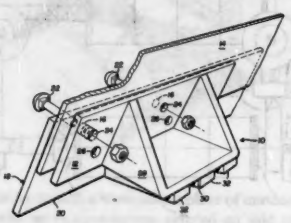


1. Apparatus for the removal of snow comprising a housing adapted to be attached to a vehicle, a blower mounted within said housing, a pair of vertically rotating clearing screws attached to said housing forwardly of and flanking said blower, and an arcuate deflector plate associated with each clearing screw, each of said deflector plates being mounted so as to lie adjacent the peripheral edge or generatrix of the associated clearing screw and being movable in a circular path, coaxial to the axis of rotation of the associated screw from a position forwardly of the plane in which the axes of rotation of each of said screws lie to a position to the rear thereof.

4,346,528
SKID SHOE FOR SNOW PLOW BLADE

Warren M. Shwayder, 2335 E. Lincoln, Birmingham, Mich. 48008

Filed Nov. 14, 1980, Ser. No. 206,801
Int. Cl.³ E01H 5/06
U.S. Cl. 37—270 6 Claims

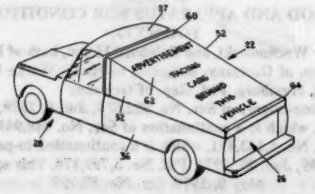


1. A skid shoe for a snow plow blade, said shoe being attached to the moldboard of said plow at the pre-existing bolt holes used to fasten said blade to said moldboard such that said shoe is mounted close to the cutting edge of said blade, said skid shoe including a bracket, and a plurality of weldable hard carbide wear bars mounted to said bracket for engaging a roadbed and for supporting the cutting edge of said blade such that the abrasive action on said blade from the roadbed is reduced by said wear bars;
and wherein each wear bar includes a matrix of carbide particles and ductile bronze packed in a weldable steel jacket, said ductile bronze providing substantial durability and shock-absorption to said particles, and said wear bars being weldable to said bracket and easily replaced by welding a new bar on the top of an old one or by welding a new bar directly to said bracket.

4,346,529
ADVERTISING DISPLAY FOR PICK-UP TRUCKS OR SIMILAR VEHICLES

Louis D. Keller, 3638 E. McMillan Rd., Twin Lake, Mich. 49457

Filed Jan. 27, 1981, Ser. No. 228,747
Int. Cl.³ G09F 21/04
U.S. Cl. 40—588 13 Claims



1. In combination with a pick-up truck having a cab and a rear deck with upstanding side walls,
a frame having a front, back and opposite sides, the front of the frame being adjacent the cab and the back of the frame being adjacent a back portion of the rear deck of the truck;
means for removably mounting the frame to the rear truck deck;
the front of the frame extending upwardly to a height near the top of the cab and sides of the frame sloping downwardly and rearwardly to a height near the top of the

truck deck side walls, thereby defining a sloping rear wall on the frame;

a medium bearing a plurality of advertising messages;

means for mounting said medium on the frame for display of one advertising message along the sloping rear wall of the frame so as to be visible from the rear of the truck; and

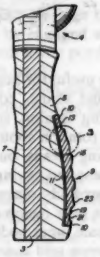
means for moving the medium within the frame to sequentially display different advertising messages.

4,346,530

LEATHER INLAY PISTOL GRIP AND METHOD OF MANUFACTURE

Finton E. Stewart, and Sylvia M. L. B. Stewart, both of P.O. Box 2863, Flagstaff, Ariz. 86003

Filed Mar. 31, 1980, Ser. No. 135,499
Int. Cl.³ F41C *23/00*
U.S. Cl. 42—71 R **7 Claims**



1. A gripping structure for a gun, said gripping structure comprising in combination:

a first gripping member attached to a first side portion of the gun, a first inlay groove being disposed in said first gripping member;

a first layer of adhesive disposed on a bottom surface of said first inlay groove;

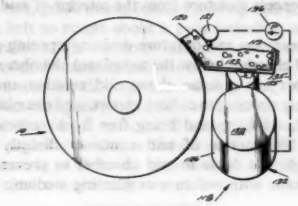
a first leather inlay having an inner surface attached by means of said first layer of adhesive to the bottom of said first inlay groove, said first leather inlay having an outer surface, an embossed pattern being disposed on said outer surface, said first leather inlay having a periphery which is substantially coextensive with the periphery of said first inlay groove such that the entire periphery of said first inlay groove fits closely to the entire periphery of said first leather inlay wherein the outer surface of said first leather inlay has a pattern embossed thereon, said embossed pattern having sufficient vertical variation therein to effect improved gripping by the trigger finger hand of the user of the gun, wherein the hardness of said first leather inlay is selected to enhance the gripping capability of said gripping structure by producing a substantially more resilient gripping surface than a wood or thermoplastic gripping surface, and wherein the thickness of said first leather inlay sufficiently exceeds the depth of said first inlay groove to make the resiliency of said first leather inlay readily detectable by the user as his trigger finger hand grips said gripping structure, said gripping structure further including a second gripping member similar to said first gripping member disposed on an opposed portion of the gun, a second inlay groove in said second gripping member substantially similar to said first inlay groove, and a second leather inlay substantially similar to said first leather inlay adhesively disposed within said second inlay groove, said first and second inlay grooves being located to hold said first and second leather inlays, respectively, at locations which cause portions of said trigger finger hand to grip said first and second leather inlays during normal firing of the gun.

4,346,531

TRANSFERRING LIQUID ONTO A ROLLER SURFACE

John H. Keeton, P.O. Box 278, Campbellsville, Ky. 42718

Continuation-in-part of Ser. No. 184,192, Sep. 5, 1980. This application Oct. 21, 1980, Ser. No. 199,365
Int. Cl.³ A01M *21/00*; A01C *23/00*
U.S. Cl. 47—1.5 **13 Claims**



1. Apparatus for transferring liquid onto the surface of a roller, and comprising:

a housing;

transfer means disposed in said housing and extending outwardly therefrom to contact a roller peripheral surface and for transferring liquid from said housing to the roller surface;

liquid supply means mounted above said transfer means for dripping liquid onto said transfer means;

a storage tank disposed below, and connected to, said housing along substantially the entire length thereof, and separated from said housing by a bottom wall of said housing;

means defining a plurality of openings in the bottom wall of said housing for allowing drainage of liquid from said housing into said storage tank; and

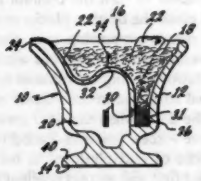
powered means for actively circulating liquid from said storage tank to said means for supplying liquid to said transfer means.

4,346,532

PLANTER

Paul D. Peterson, 3310 Azahar Pl., Rancho La Costa, Calif. 92008

Filed Oct. 9, 1979, Ser. No. 82,807
Int. Cl.³ A01G *9/02*
U.S. Cl. 47—66 **15 Claims**



1. A planter, comprising:

(a) a container with side and bottom walls at least substantially closed and with a top at least substantially open so as to be suitable to have plants growing in a planting medium in said container,

(b) said container having double walls forming at least one chamber in the bottom of said container and forming at least one air passageway leading from said chamber to near the top of one of the side walls of said container and said container having an air vent to said air passageway near the upper end of said passageway thereby to vent said chamber,

(c) said container having at least one generally horizontally extending, side aeration and moisture draining opening leading from its lower inner portion to said chamber and filtration material of gravel-like size covering said aeration and moisture draining opening to prevent blocking of said aeration and moisture draining opening with such planting medium, whereby said aeration and moisture draining opening will aerate the interior of said container and will drain excess moisture from the interior of said container, and

(d) said aeration and moisture draining opening connecting to said chamber below the top of said chamber so that said chamber has a dome above said aeration and moisture draining opening to collect vapors, said chamber having a closed, solid top and being free from vertical openings from the interior of said container directly vertically through said dome to said chamber to prevent filling of said dome with moisture or planting medium.

4,346,533

DRIVE FOR A VEHICLE DOOR

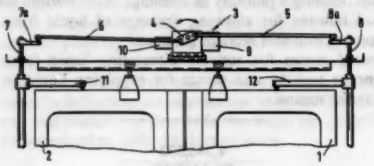
Ingo Britzke, Kassel; Manfred Horn, Kaufungen, and Peter Gossmann, Grossalmerode, all of Fed. Rep. of Germany, assignors to Gebr. Bode & Co. GmbH, Kassel, Fed. Rep. of Germany

Filed Sep. 29, 1980, Ser. No. 191,768

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1980, 3016174

Int. Cl.³ E05F *15/10*

U.S. Cl. 49—28 **10 Claims**



1. Apparatus for opening and closing a pivotal door by turning a rotatable drive column in respectively opposite directions, said appartus comprising drive means for rotating the drive column of the door in opposite directions, said drive means including a linkage member drivingly coupled to the rotatable drive column to turn the column in opposite directions to open and close the door, a platform connected to said linkage member, means supporting said platform from fixed structure for movement relative thereto when the door meets an obstacle, the platform being movable in opposite directions relative to the fixed structure in accordance with the direction of movement of the door when the door meets the obstacle in response to reactive forces, first and second resilient means for opposing movement of said platform in both directions, the arrangement of said first and second resilient means being such that movement of said platform in one direction produces stress of one of said resilient means in one direction and stress of the other of said resilient means in the other direction, both resilient means acting to return the platform to its initial position upon release of stress in the resilient means for either direction of movement of said platform, and control means for controlling the operation of the drive means and the rotation of said rotatable column comprising first and second switch means and an actuator means for contacting and operating a respective one of said switch means in correspondence with the direction of movement of the platform, one of said actuator means or switch means being secured to said platform, the other being secured to the fixed structure.

4,346,534

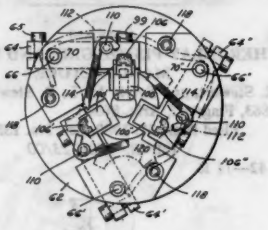
APPARATUS FOR HONING CYCLOIDAL SURFACES

Albin S. Czubak, Holland, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Jun. 13, 1980, Ser. No. 159,020

Int. Cl.³ B24B *33/02, 5/16*

U.S. Cl. 51—34 A **10 Claims**



1. A honing machine useful for honing a gerotor ring workpiece having a cycloidal shape, comprising housing means movable in reciprocating fashion, spindle means disposed in said housing means for rotation about a spindle axis and reciprocable with said housing means, outer body means affixedly held to said housing means and having a cycloidal shaped outer gear means, and an inner body means coupled to said spindle means and having inner gear means eccentrically rotatable in said outer gear means, said inner body means having a bearing means interacting between said inner body means and outer body means to allow transverse motion of said inner body means perpendicular to the spindle axis during honing, a tool holder assembly means affixedly held to said inner body means having a plurality of tool holder means pivotally held to said assembly means and having an actuating means for urging said tool holder means on an arc toward the workpiece during machining, a retracting means for disengaging said tool holder means from the workpiece.

4,346,535

CAM GRINDING MACHINE

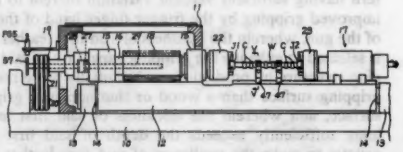
Hiroaki Asano, Chiryu; Hiroshi Ota, and Kenji Yamakage, both of Kariya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 9, 1980, Ser. No. 167,034

Claims priority, application Japan, Jul. 13, 1979, 54-89578

Int. Cl.³ B24B *19/12*

U.S. Cl. 51—101 R **4 Claims**



1. A cam grinding machine for grinding a plurality of cam portions of a cam shaft comprising:

a traverse table;

a rocking table swingably supported on said traverse table;

a spindle rotatably supported on said rocking table;

a master cam shaft mounted on said spindle and provided with a plurality of master cams having the same cam profiles as said plurality of cam portions of said cam shaft;

a tailstock mounted on said rocking table;

a support spindle rotatably and slidably supported by said tailstock in coaxial alignment with said spindle;

a chuck body secured to said spindle for rotation therewith;

a substantially cup-shaped resilient diaphragm secured to said chuck body at the open end thereof and provided with a cylindrical hub portion at its central portion which is extended from the end wall of said diaphragm toward the open end of said diaphragm;

a plurality of jaw bases fixed to the end wall of said diaphragm in angularly spaced relationship therearound;

a jaw threaded into each of said jaw bases for adjustment in a radial direction of said diaphragm;

a hydraulic actuator formed in said spindle, a piston rod thereof extending centrally through said spindle and connected to said hub portion of said diaphragm for deflecting said diaphragm to cause said jaws to clamp one journal portion of said cam shaft;

a support block secured to said chuck body within said diaphragm and formed with an opening;

a key member pivotably supported within said opening;

a spring interposed within said support block to bias one end of said key member;

the other end of said key member being bifurcated to form an engaging face to be engaged with the end face of said cam shaft and to form a key portion to be inserted into a key way of said cam shaft;

chuck means provided on said support spindle for clamping another journal portion of said cam shaft; and

means for rotating said spindle.

4,346,536

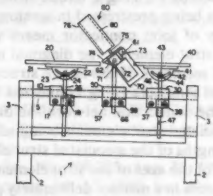
TILTING ARBOR BELT SANDER

Norman E. Bryden, 2407 Arden Dr., Champaign, Ill. 61820

Filed Jan. 5, 1981, Ser. No. 222,690

Int. Cl.³ B24B *21/00*

U.S. Cl. 51—135 R **2 Claims**



1. A belt sanding apparatus comprising:

(a) a frame, including a pair of spaced, parallel, horizontal tubular elements disposed adjacent the top of said frame,

(b) three mounting head elements positioned on said pair of horizontal tubular elements of said frame and adapted for slideable engaging movement with and along said horizontal tubular elements, said mounting head elements including means for releaseably fixing same in particular positions longitudinally of said horizontal tubular elements, said mounting head elements each being provided with spaced, vertical openings therein and with a pair of spaced, parallel, vertical tubular elements which are received in slideable engagement within said vertical openings, each of said mounting head elements being provided with means for adjusting and releaseably fixing the respective pair of vertical tubular elements located thereon in a particular vertical location,

(c) a table member attached above and to each of the respective two mounting head elements adjacent the ends of said frame, each of said table members being attached to said mounting head elements through the respective vertical tubular elements thereof and being adapted for pivotal movement about a horizontal axis perpendicular to said horizontal tubular elements of said frame, each of said table members being provided with means for releaseably fixing the particular angular positioning thereof relative to horizontal,

(d) an arbor element attached above and to the middle of said mounting head elements, said arbor element being attached to said mounting head element through said vertical tubular elements thereof and being adapted for pivotal movement about a horizontal axis perpendicular to said horizontal tubular elements of said frame, said arbor element being provided with means for releaseably fixing the particular angular positioning thereof relative to horizontal,

(e) a sanding mechanism mounted on and moveable with said arbor element, said sanding mechanism including a rotatable sanding belt, guide means for said sanding belt adapting said sanding belt to rotate about a path including an extended path parallel to the widths of said table members and transversely of said horizontal tubular elements of said frame, and motor means for driving said sanding belt, said sanding mechanism being adapted to expose the edge of a flat workpiece positioned on one of said table members to varying vertical angles of contact with said sanding belt to sand said work-piece in a direction transversely of said horizontal tubular elements of said frame.

4,346,537

CAPACITOR TRIMMING SYSTEM IN A QUARTZ-CRYSTAL OSCILLATOR

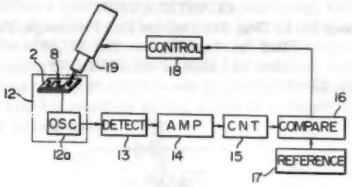
Sho Masujima, Tokyo, and Shoichi Iwaya, Kasagata, both of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Nov. 27, 1979, Ser. No. 97,900

Claims priority, application Japan, Nov. 30, 1978, 53-148469

Int. Cl.³ B24C *3/32*; H01G *1/015*

U.S. Cl. 51—413 **4 Claims**



1. A trimming system for a quartz-crystal oscillator comprising:

(a) an oscillation circuit including a quartz-crystal piece, a trimmer capacitor coupled to said quartz-crystal piece for adjusting the oscillating frequency of the quartz-crystal piece, and a semiconductor electronic circuit coupled to said quartz-crystal piece for operating said quartz-crystal piece;

(b) said trimmer capacitor having at least a fixed outer trimming electrode, a common inner electrode fixed parallel to said trimming electrode and dielectric body sandwiched between said two electrodes, at least said trimming electrode being exposed for enabling the trimming of the area of the trimming electrode, said trimming electrode having a coarse adjustment portion parallel and aligned with said common electrode and a fine adjustment portion positioned in the same plane as the coarse adjustment portion but outside of said common electrode,

(c) a signal detector coupled acoustically with said quartz-crystal piece for providing an electrical signal relating to the oscillation of said quartz-crystal piece,

(d) a counter means connected to the output of said signal detector through an amplifier for measuring the oscillating frequency of said quartz-crystal piece,

(e) a reference frequency oscillator for providing the desired reference frequency,

(f) a comparator coupled to said counter and said reference frequency oscillator, for comparing the frequency of said quartz-crystal oscillator measured by said counter means with the output frequency of said reference frequency oscillator,

(g) a trimming unit operably coupled to said trimmer capacitor, for trimming the area of said trimming electrode of said trimmer capacitor,

(h) a memory means coupled to said counter means for storing the frequency f_1 measured by said counter means in the preceding trimming step,

(i) a calculation means coupled to said memory means, for providing the difference f_3 between the twice ($2f_2$) of the frequency measured by said counter means at the present step and the output (f_1) of said memory means,

(j) a second comparator coupled to said calculation means and said reference frequency oscillator, for comparing the output (f_3) of said calculation means with the output frequency (f_0) of the reference frequency oscillator, and providing a trigger signal when f_3 is equal to or larger than f_0, and

(k) a trimming unit control operably coupled to said trimming unit, for controlling the operation of said trimming unit according to the output of said comparator, said trimming unit control being arranged to control the trimming unit so that the coarse adjustment portion of said trimming electrode is initially trimmed and when said second comparator provides the trigger signal thereto, the fine adjustment portion of said trimming electrode is trimmed until the oscillation frequency of said quartz-crystal piece reaches the reference frequency.

4,346,538

BLOW-IN/BLOW-OUT DOUBLE-SKIN WALL CONSTRUCTION

Raymond M. L. Ting, 318 Holiday Dr., Pittsburgh, Pa. 15237

Filed Jul. 11, 1980, Ser. No. 167,467
Int. Cl.³ E04C *2/46*; E04B *1/98*
U.S. Cl. 52—1 **4 Claims**

1. A building wall construction comprising:

a building framework including a first frame member and spaced therefrom a second frame member, said first frame member and said second frame member being adjacent to each other;

a liner panel spanning the distance between said frame members;

confinement means releasably retaining one liner panel end to said first frame member;

fastening means positively securing said liner panel to said second frame member;

outboard support means connected to each of said frame members and extending beyond said liner panel;

subgirt means secured to the mid-region of said liner panels;

a facing panel positively secured at its mid-region to said outboard support means;

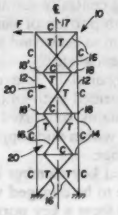
fastening means positively securing one end of said facing panel to said subgirt means; confinement means releasably retaining the other end of said facing panel.

4,346,539

LATTICE BEAM-COLUMNS

John S. Ellis, Kingston, Canada, assignor to Her Majesty the Queen as represented by the Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Filed Mar. 3, 1980, Ser. No. 126,999
Claims priority, application Canada, Mar. 29, 1979, 324564
Int. Cl.³ E04C *3/10*
U.S. Cl. 52—226 **11 Claims**



1. A prestressed structural member comprising:

(i) a pair of longitudinal elements spaced apart and prestressed in compression;

(ii) a plurality of strut elements spaced apart with each strut element extending between the longitudinal elements and disposed orthogonally of a line equidistant from each longitudinal element, the strut elements being prestressed in compression;

(iii) a plurality of diagonal members diagonally oriented in pairs of box sections formed by the longitudinal and strut elements, thereby forming a lattice structure, said diagonal members being prestressed in tension; and

(iv) a plurality of joint connector means rigidly interconnecting the strut elements, the diagonal members and the longitudinal members of the lattice structure, the ends of said diagonal members being connected to said strut elements and the connection between the diagonal members and the associated strut elements being substantially offset along the lengths of the associated strut elements from the intersection of the axes of the strut elements and the longitudinal elements in a manner deliberately providing predetermined eccentricity of forces carried by each diagonal member relative to the geometrical intersection of the axes of the strut and longitudinal elements, said diagonal members intersecting said strut elements inwardly of the intersection between the strut elements and the longitudinal elements and the point of intersection being offset from the intersection between the strut and longitudinal elements by a distance equal to about 10 percent of the length of the strut elements.

4,346,540

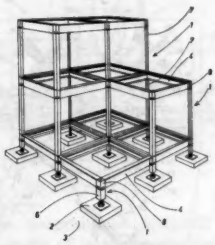
DEVICE RELATING TO BUILDING FRAMEWORKS

Leif Anderson, Bögatan 39 A, 412 72 Göteborg, Sweden

PCT No. PCT/SE79/00167, § 371 Date Apr. 9, 1980, § 102(e) Date Apr. 8, 1980, PCT Pub. No. WO80/00356, PCT Pub. Date Mar. 6, 1980
PCT Filed Aug. 8, 1979, Ser. No. 192,591
Claims priority, application Sweden, Aug. 9, 1978, 7808502
Int. Cl.³ E04B *1/24, 1/54*
U.S. Cl. 52—274 **9 Claims**

1. In a building framework system having a foundation supporting a number of vertical uprights in the longitudinal direction divided into elements joined to the ends of each other to form a respective complete upright, a number of substantially horizontal beams provided for the support of areas forming floor structure elements at least partly positioned above each other to form several stories of the building, which beams are provided at their ends for supporting the same by the upright elements and joining the same together with the re-

spective upright, and coupling means at the points where the upright elements are joined together and including coupling elements for attaching of the ends of the respective upright elements to each other and elements for supporting the beams connected to the coupling means, the improvement wherein the upper end of the lower upright element in the respective joint between two upright elements is permanently provided with the supporting elements for the beams at right angle to each other and further provided with a first part of the element for attaching the ends of the upright elements to each other and



cooperating with a second part at the lower end of the upright element positioned as an upper element in the joint between the two upright elements, the end of said lower upright element being provided with projecting pins forming at least a part of the supporting elements for the beams, which beams are provided with projecting flanges arranged to rest against the ends of the upright elements and provided with holes cooperating with the pins for fixation of the respective beams, said pins forming at least a portion of said first part of the element for attaching the ends of the upright elements to each other.

4,346,541

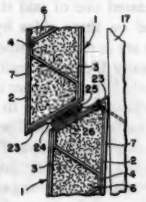
BUILDING PANEL CONSTRUCTION AND PANEL ASSEMBLIES UTILIZING SAME

Robert F. Schmitt, Beres, Ohio, assignor to G & S Company, Strongsville, Ohio

Continuation of Ser. No. 938,383, Aug. 31, 1978, abandoned. This application Jul. 17, 1980, Ser. No. 169,712

Int. Cl.³ E04C *1/00*

U.S. Cl. 52—309.11 **43 Claims**



1. A building panel construction comprising a pair of facing sheets defining opposite sides of the panel; a trapezoidally corrugated sheet sandwiched between said facing sheets, the corrugations of said corrugated sheet having oppositely facing flat crests engaging said facing sheets, the first and last corrugations of said corrugated sheet having flat sides defining opposite beveled parallel edges of said panel adapted for butted engagement with the beveled edge of another panel; said edges of said panel having oppositely disposed longitudinally extending strips attached thereon for interlocking engagement with strips on the edges of adjacent panels; and rigid foam insulation filling the trapezoidal spaces defined between said facing sheets and corrugated sheet and bonded to the facing sheets and corrugated sheet.

4,346,542

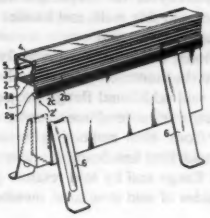
JOINT FOR USE IN CONCRETE DEPOSIT

Kohkichi Tateno, No. 39-21, Zenpukuji 2-Chome, Suginami-ku, Tokyo, Japan

Filed Jul. 9, 1979, Ser. No. 55,606

Int. Cl.³ E01C *11/10*; E04F *15/14*

U.S. Cl. 52—396 **7 Claims**



1. A joint for use in a concrete deposit, comprising an elongated joint body made of soft material adapted to be placed into the concrete deposit for the purpose of separation, a capping assembly mounted on top of said joint body, said capping assembly including a capping member connected to said joint body and a cap detachably secured to said capping member, said capping member having a lower portion engaged with and located along the entire length of said joint body and an upper portion extending upwardly from said lower portion to thereby define a space therein along the joint body, said cap being dimensioned for covering the space of said upper portion to close the same, said cap being placed on the upper portion of said capping member when concrete is hardened, and leg members removably attached to said joint body for supporting the joint, said leg members having means to vertically adjust the height of said joint.

4,346,543

BUILDING INSULATION SYSTEMS

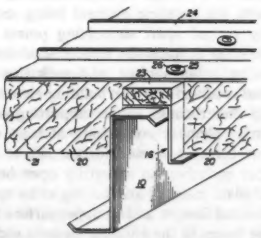
Keith E. Wilson, and Phillip W. Blackmore, both of Camlachie, Canada, assignors to Fiberglas Canada, Inc., Toronto, Canada

Filed Jun. 20, 1980, Ser. No. 161,494

Claims priority, application Canada, May 8, 1980, 351511

Int. Cl.³ E04B *1/74*

U.S. Cl. 52—404 **14 Claims**



1. A metal building insulation system, comprising:

elongate metal structural members of a building frame spaced apart from one another in mutually parallel relationship;

said structural members each having a flange at the outermost sides of the respective structural member;

said flanges each having an outer face directed outwardly of said building frame;

at least one layer of heat insulating material extending between said structural members; and

means for retaining said heat insulating layer relative to said structural member, said retaining means comprising:

(a) a channel member overlying said flanges of each of said structural members and having an intermediate portion located outwardly of and extending across respective ones of said outer faces, a pair of side walls projecting inwardly from opposite longitudinal sides of said intermediate portion and a retainer projection extending laterally of the respective structural member from one of said side walls and located inwardly of said heat insulating layer; and

(b) an additional flange facing inwardly of the building frame from the innermost sides of each of said structural members, said additional flange projecting laterally of the respective structural member at the side thereof opposite from the respective retainer projection, whereby said heat insulating layer is retained by said additional flange and by said retainer projection at the opposite sides of said structural member.

4,346,544

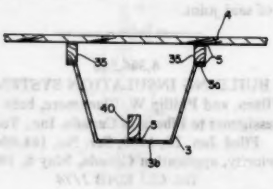
LIGHTWEIGHT BUILDING ELEMENTS WITH HIGH CARRYING CAPACITY

Jens-Frederik Larssen, Birger Jarlsgatan 62, 114 29 Stockholm, Sweden

Continuation-in-part of Ser. No. 950,291, Oct. 11, 1978, abandoned, which is a continuation of Ser. No. 569,592, Apr. 21, 1975, abandoned. This application May 30, 1979, Ser. No. 43,824

Int. Cl.³ E04C *1/24*

U.S. Cl. 52—407 **18 Claims**



1. A lightweight carrier element for forming a building element made of a number of interconnected lightweight carrier elements, the building element being mounted between horizontally spaced apart supporting points with its upper surface extending horizontally to be loaded downwardly from above onto its upper surface, and such that a downwardly directed load received onto the building element is transmitted horizontally therethrough to the supporting points, said lightweight carrier element comprising at least one lower base member for receiving tension forces, said at least one lower base member including an upwardly open box made of thin sheet metal plate material and having at its upper edges horizontally directed flanges, and an upper surface layer for receiving pressure forces in the building element and made of wood material which is essentially stiffer in all directions than the sheet metal plate of said at least one lower base member, said surface layer being wider than, and extending longitudinally beyond both sides of, its corresponding at least one lower base member, a wooden bar disposed between each of said lower base member flanges and said surface layer, each wooden bar being firmly connected to each of the lower base member and the surface layer by a continuous glue joint such that said wooden bars, surface layer, and at least one lower base member function as a one piece integral element to provide a statically cooperating and interacting carrier unit.

4,346,545

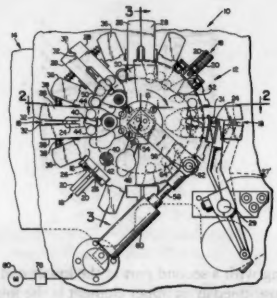
SEALING WHEEL FOR FORMING FIN SEAL PACKAGE

Francis C. Crescenzo, Springfield, and Paul J. LaFleur, Jr., Wilbraham, both of Mass., assignors to Package Machinery Company, East Longmeadow, Mass.

Filed Dec. 26, 1979, Ser. No. 107,174

Int. Cl.³ B65B *11/28*

U.S. Cl. 53—234 **15 Claims**



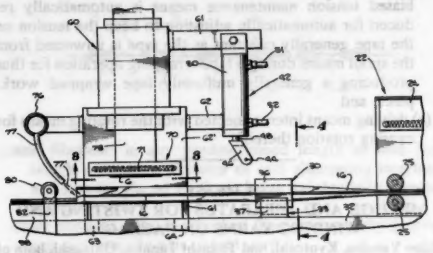
1. A sealing wheel comprising a wheel assembly, and drive means for rotatably indexing said wheel assembly through a plurality of positions including an article loading position and article discharging position, said wheel assembly including a wheel body, stationary jaw means on said wheel body defining at least one radially outwardly opening pocket for receiving an article and its wrapper and forming the wrapper in a U-fold around the article when said one pocket is in said loading position and including a pair of stationary jaws mounted in fixed position relative to said wheel body and having opposing parallel jaw surfaces defining said pocket, a pair of opposing sealing jaws pivotally supported on said wheel body in association with said one pocket for movement between open and closed positions, each of said sealing jaws being supported for movement relative to the wheel body and having a recess within which an associated one of said stationary jaws is received and surrounded on three sides by said sealing jaws when said sealing jaws are in closed position, said sealing jaws having opposing generally U-shaped sealing surfaces on said three sides for sealing said folded wrapper on three sides of said article, said stationary jaws positioned to maintain in spaced relation to said sealing surfaces marginal portions of a wrapper contained within and extending outwardly beyond the confines of said pocket when said sealing jaws are in said open position, said sealing surfaces being engageable with the extending marginal portions of the wrapper when said sealing jaws are in closed position, means for heating at least one of said sealing surfaces, means for normally biasing said sealing jaws toward said closed position and means for opening said sealing jaws when said sealing wheel is indexed to a predetermined position by said drive means and including a cam shaft supported on said wheel body between said sealing jaws for angular movement about its axis, said cam shaft and said jaws having coengageable cam surfaces for simultaneously pivoting said sealing jaws away from said stationary jaws and each other in response to angular movement of said cam shaft about its axis, a stationary cam, and an opener lever attached to said cam shaft and engaged with said stationary cam for angularly moving said cam shaft when said sealing wheel is indexed to said predetermined position.

4,346,546

AUTOMATIC FLEXIBLE CONTAINER FABRICATING MACHINE

Sidney Tasker, 853 N. Detroit St., Los Angeles, Calif. 90046

Continuation of Ser. No. 951,716, Oct. 16, 1978, abandoned.
This application Jul. 24, 1980, Ser. No. 172,067
Int. Cl.³ B65B *61/18, 43/00*
U.S. Cl. 53—412 10 Claims



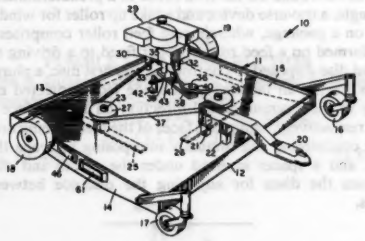
1. A machine comprising an elongated frame, means for transporting a length of tubing longitudinally thereover, the tubing being standard round tubing rolled flat, means for distending the tubing for slitting by blowing air into a slit already made, means for partially slitting the tubing at predetermined spaced positions in said distended posture to provide sections of tubing, means outside of the tubing to hold it distended adjacent the slitting means, means for applying a predetermined seal adjacent a slit in the tubing at the end of a section including means for retaining the opposite sides of the tubing in closely contiguous and proximate relationship and means for sealing portions of the tubing adjacent to said slit to provide an openable closure, means for advancing the tubing in incremental steps, means for opening a tube portion at a slit at the opposite end of said section, means for filling said tube portion from said opposite end and means for sealing said tube portion adjacent said last mentioned slit.

4,346,547

LAWN MOWER

Robert B. Allison, 8424 E. Lake Rd., Erie, Pa. 16511

Filed Mar. 27, 1981, Ser. No. 248,264
Int. Cl.³ A01D *35/26*
U.S. Cl. 56—13.6 10 Claims



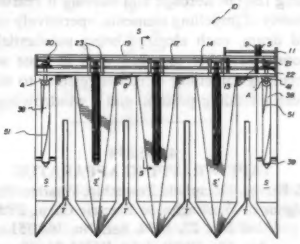
1. In combination, a mower having
a rectangular platform,
two rear ground engaging wheels and two front engaging wheels,
means vertically and adjustably supporting said rear wheels and said front wheels on said platform,
an internal combustion engine,
support means supporting said engine on said platform,
two spaced blade shafts extending downward through said platform, each said blade shaft having a blade on its end below said platform,
a pulley on each said blade shaft,
an engaging pulley on said engine shaft,
a belt tightener pulley,
tension means supporting said belt tightener pulley on said platform,
said engine support means comprising four spaced, downwardly extending columns welded on said platform and supporting said engine,
said tension means comprising a belt tensioner arm having said belt tightener pulley on the first end and pivoting other end of said belt tightener arm around the right front engine support column,
said engine support means comprising four spaced downwardly extending columns welded on said platform and and a belt passing around said pulleys.

4,346,548

ATTACHMENT FOR A HARVESTER FOR PICKING UP DOWNED CORN STALKS

Cecil G. Atkinson, White City, Kans. 66872

Filed Apr. 8, 1981, Ser. No. 252,156
Int. Cl.³ A01D *45/02, 75/00*
U.S. Cl. 56—119 10 Claims



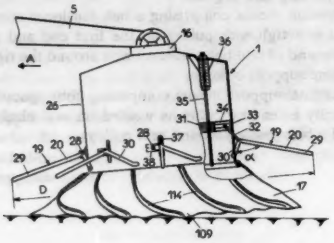
1. An attachment for a harvester for picking up and combining downed corn stalks or the like in which the harvester is of the type having a plurality of inner dividers and two outer dividers, all with tapered snouts between which throats are provided defining entrances to the combine for upright rows of corn to pass through comprising in combination:
a support frame,
roller means carried on a top surface of the outer dividers,
chain means having outwardly extending flexible finger means carried on a top surface of the inner dividers,
and drive means extending from a power takeoff of the harvester and encased in said support frame to operatively run both said roller means and said chain means whereby upright corn stalks pass into the combine through the throat areas unaffected, but downed and bent corn stalks are lifted up and directed to the corn stalk entrance of the combine, said chain means is rotatably supported and driven at one extremity proximate said frame by a driven shaft defining a portion of said drive means, and supported at a remote extremity external said frame by a support rod resiliently connected to said support frame.

4,346,549

AGRICULTURAL MACHINE FOR TEDDING AND WINDROWING FODDER CROPS

Albert Wattron, Schwenheim, and Michel Quirin, Allenwiller, both of France, assignors to Belrecolt S.A., Marmoutier, France

Filed Dec. 12, 1980, Ser. No. 215,851
Claims priority, application France, Dec. 20, 1979, 79 31889
Int. Cl.[3] A01D 79/00
U.S. Cl. 56—370 68 Claims



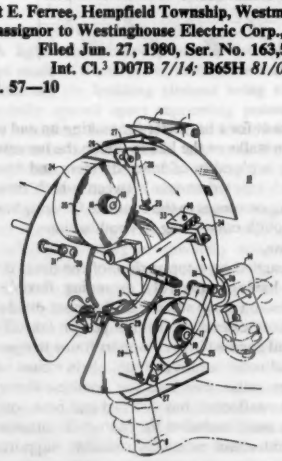
1. In a machine for handling cut herbage during forward movement of the machine on the ground,
in combination,
a support,
at least one drum mounted on said support for rotation about an upright axis,
driving means operable for rotating said drum about said axis,
a flexible deformable skirt mounted on the lower portion of said drum for rotation therewith and operative for lifting the cut herbage and moving it rearwardly, and
a plurality of impelling elements, operatively connected to said drum, each element being substantially simultaneously movable together with at least some of the remaining impelling elements relative to said skirt between a tedding position and a windrowing position.

4,346,550

TAPE WRAPPING APPARATUS

Herbert E. Ferree, Hempfield Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 27, 1980, Ser. No. 163,551
Int. Cl.[3] D07B 7/14; B65H 81/08
U.S. Cl. 57—10 3 Claims



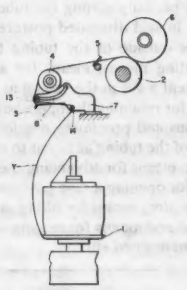
1. Tape wrapping apparatus, comprising:
(a) a support frame;
(b) rotating means rotatably disposed upon the support frame for rotating about a workpiece which is to be taped;
(c) spool means disposed upon the rotating means for feeding tape to the workpiece as the rotating means rotates for tape wrapping the workpiece;
(d) spring biased tension maintenance means disposed on the rotating means in a disposition of forceful contact with the tape on the spool means whereby the biasing of the spring biased tension maintenance means is automatically reduced for automatically adjusting to keep the tension on the tape generally constant as the tape is unwound from the spool means during a tape wrapping operation for thus producing a generally uniformly tape wrapped workpiece; and
(e) driving means interconnected with the rotating means for causing rotation thereof.

4,346,551

METHOD AND APPARATUS FOR TWISTING AND WINDING YARNS ON PACKAGES

Hideo Yanobu, Kyotoshi, and Tadashi Tanaka, Ohtsushi, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Japan

Filed Jul. 25, 1980, Ser. No. 172,384
Claims priority, application Japan, Jul. 27, 1979, 54-96430
Int. Cl.[3] D01H 1/10, 13/10
U.S. Cl. 57—62 6 Claims



1. An apparatus for twisting and winding yarns on packages including a double twisting spindle, a feed roller for reducing the tension of yarn coming from the double twisting spindle, an adjustable winding angle-adjusting device which is arranged between the double twisting spindle and the feed roller to set a yarn to be wound on the feed roller at a predetermined winding angle, a traverse device and a take up roller for winding the yarn on a package, wherein said feed roller comprises a first disc formed on a feed roller proper fixed to a driving shaft, a second disc disposed to confronting the first disc, a plurality of pieces having an inclined yarn guide face projected equidistantly in the circumferential direction on an end face of the discs respectively, said guide faces of the pieces being arranged to be confronting and mutually interposing between the two discs, and a spacer inserted under the pieces and disposed between the discs for adjusting the distance between the pieces.

4,346,552

BULKY TEXTURED MULTIFILAMENT YARN

Takao Negishi, and Kazuo Tomiita, both of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

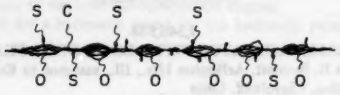
Continuation of Ser. No. 13,198, Feb. 16, 1979, abandoned. This application Dec. 5, 1980, Ser. No. 213,368
Int. Cl.[3] D02G 3/34, 1/20; D02J 1/08
U.S. Cl. 57—208 16 Claims

1. A bulky textured multifilament yarn composed of a plurality of individual filaments having false-twisted crimps; the crimps of each of said filaments being irregularly distributed

along its length as compared to the crimp distribution of other filaments of said yarn;

said yarn comprising sections of interlaced individual filaments and sections of non-interlaced individual filaments;

said interlaced sections and non-interlaced sections being formed alternately along the lengthwise direction of said yarn;



said filaments in any predetermined length of said yarn, which contains a plurality of said alternating interlaced and non-interlaced sections, being substantially identical in length; and

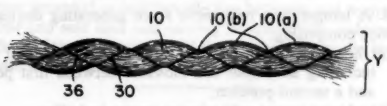
some portions of said individual filaments partially protruding out from the axis of said yarn.

4,346,553

HELICALLY WRAPPED YARN

Ira Schwartz, Villanova, Pa., assignor to Conshohocken Cotton Co., Inc., Conshohocken, Pa.

Filed Nov. 9, 1979, Ser. No. 92,997
Int. Cl.³ D02G 3/36, 3/38
U.S. Cl. 57—210 **10 Claims**



1. Wrapped core yarn comprising:

(a) a core composed of fibers so arranged that the core has substantially zero tensile strength, and

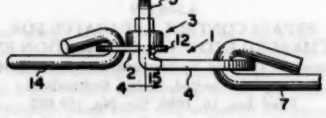
(b) a plurality of wrapper yarns wrapped under tension in both the clockwise and the counterclockwise directions around said core, whereby said yarns periodically cross over one another, said tensions on said wrapper yarns being balanced by each other and being so high as to compress said core in areas where said wrapper yarns cross over one another along the length of the core and impart to the core a sinuous configuration along its length.

4,346,554

FUSIBLE LINK CONSTRUCTION

Hermann R. Glinecke, Pennington, N.J., assignor to Globe Fire Equipment Company, Standish, Mich.

Filed Nov. 13, 1979, Ser. No. 93,398
Int. Cl.³ F16G 15/04
U.S. Cl. 59—93 **13 Claims**



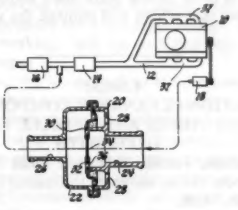
1. A fusible link construction comprising a first body having an opening therein with two spaced apart, opposed marginal edges, said first body having an extension projecting in one direction therefrom; a second body extending slidably through said opening at one marginal edge thereof, said second body having an extension projecting in one direction therefrom, said extensions projecting from their respective bodies in opposite directions; a collapsible strut accommodated in said opening and spanning the distance between said second body and the opposite marginal edge of said opening; normally engaged retaining means carried by said first body and said strut; abutment means carried by said second body and extending beyond said one marginal edge of said opening for engagement with said first body; thermally sensitive means forming part of said strut and normally preventing movement of said second body toward said opposite marginal edge of said opening a distance sufficient to enable said abutment to clear said one marginal edge of said opening, said thermally sensitive means being responsive to an increase in its temperature to a predetermined level to enable collapse of said strut an amount sufficient to enable said abutment to clear said opposite marginal edge of said opening and said second body to be withdrawn from said opening; and means on each of said extensions for coupling them to force applying means operable to withdraw said second body from said opening in response to collapse of said strut.

4,346,555

EXHAUST AIR FLOW PROPORTIONING VALVE

Donald D. Stoltman, Henrietta, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 16, 1980, Ser. No. 159,455
Int. Cl.³ F01N 3/22
U.S. Cl. 60—290 **1 Claim**



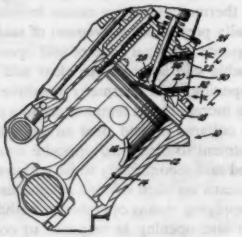
1. In combination with an engine having an exhaust system directing exhaust flow from the engine and an air pump directing air to said exhaust system, a valve controlling the rate of air flow from said pump to said exhaust system, said valve comprising a housing having a supply port connected to said pump and receiving a supply air flow from said pump at a supply pressure, a delivery port connected to said exhaust system and delivering an exhaust air flow to said exhaust system at a delivery pressure substantially equal to the pressure in said exhaust system, an excess air port discharging an air flow at substantially atmospheric pressure, and a valve seat surrounding said supply port and separating said supply port from said excess air port, and a diaphragm secured in said housing and separating said delivery port from said supply port and said valve seat and said excess air port, said diaphragm having an orofice directing said exhaust air flow from said supply port to said delivery port and one face of said diaphragm having a valve surface surrounding said orifice and associated with said valve seat, whereby the supply pressure in said supply port acts against the portion of said diaphragm face surrounded by said valve surface in opposition to the delivery pressure in said delivery port acting against the opposite face of said diaphragm and displaces said diaphragm from said valve seat the amount necessary for the rate of said exhaust air flow to be proportional to the rate of exhaust flow through said exhaust system and for the remainder of said supply air flow to be discharged through said excess air port.

4,346,556

INSULATING ENGINE EXHAUST PORT LINER

Hal H. Rice, Birmingham, and Gary A. Kruger, Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 12, 1980, Ser. No. 148,904
Int. Cl.³ F01N 7/14, 7/16, 7/18
U.S. Cl. 60—272 3 Claims



1. An insulating exhaust port liner for internal combustion engines and the like, said liner comprising

a formed thin wall body of rigidized fibrous ceramic of relatively low mass and high insulating value, said body being shaped to define at least part of the inner wall of a high temperature exhaust gas passage, and

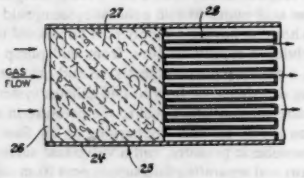
an abrasion resistant ceramic coating fused onto at least the inner gas-exposed surface of said body, said coating comprising a mixture of fused silica cement and fine glass frit sintered in place on the body inner surface at a temperature below that which will damage the thin walls of the body.

4,346,557

INCINERATION-CLEANABLE COMPOSITE DIESEL EXHAUST FILTER AND VEHICLE EQUIPPED THEREWITH

Farhang Shadman, Tucson, Ariz., and Louis Hegedus, Grosse Pointe Woods, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 7, 1980, Ser. No. 147,599
Int. Cl.³ F01N 3/02; B01D 41/04, 50/00
U.S. Cl. 60—311 3 Claims



1. A composite incineration-cleanable diesel exhaust particulate filter comprising

first and second filter sections capable of withstanding exhaust system and particulate incineration temperatures and disposed in series to provide for diesel exhaust gas flow through the first and then the second filter sections,

said first filter section comprising a high temperature-resistant through-flow depth-type filter material capable of collecting diesel exhaust particulates with moderate efficiency and pressure drop at many locations along interconnected paths of gas flow through said first section, and

said second filter section comprising a high temperature-resistant wall-flow monolith structure having an extended gas-porous wall surface capable of collecting diesel particulates thereon with relatively high efficiency and low pressure drop,

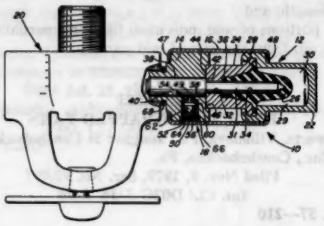
said filter being incineration-cleanable while installed by heating the exhaust gas supplied to the filter to a temperature adequate to burn particulates collected in the first filter section whereby the gas temperature in the second section is raised to a level adequate to incinerate particulates collected therein.

4,346,558

THERMAL ACTUATOR WITH LOCK OPEN FEATURE

Thomas B. Bernett, Arlington Hts., Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 15, 1980, Ser. No. 149,865
Int. Cl.³ F01B 29/10
U.S. Cl. 60—527 7 Claims



1. A temperature responsive force generating device, said device comprising:

(a) thermally responsive actuator means, said actuator means including an output rod movable between first position and a second position;

(b) adapter means, said adapter means including,

(i) a member having a guide surface therein, said output rod received and guided by said surface, said member having a generally transversely extending surface defining a shoulder and intersecting with said guide surface; and

(ii) means for connecting said member to said actuator means,

(c) means for locking said output rod in said second position, said locking means associated with said member and including,

(i) a pin movable in said transverse surface between a first position permitting movement of said actuator rod and a second position limiting movement of said actuator rod in at least one direction,

(ii) means for biasing said pin toward said second position,

(iii) a temperature sensitive fusible member disposed intermediate a portion of said pin and said shoulder for preventing movement of said pin to said second position at temperatures below a predetermined value, said fusible member permitting movement of said pin to said second position only at temperatures at and above said predetermined value.

4,346,559

BYPASS CONTROL APPARATUS FOR TURBOCHARGED INTERNAL-COMBUSTION ENGINES

Bruno Zumstein, Lucerne, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Jun. 16, 1980, Ser. No. 159,607
Claims priority, application Switzerland, Jul. 11, 1979, 6462/79
Int. Cl.³ F02B 37/00
U.S. Cl. 60—606 2 Claims

1. In a bypass control apparatus for turbocharged internal-combustion engines having an opening characteristic depen-

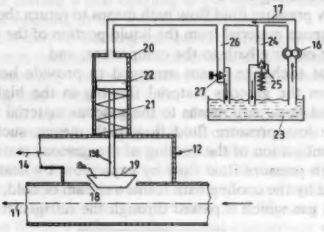
dent upon the engine speed for a bypass valve, the bypass valve being located in a bypass line which connects a point of a boost air line located downstream of a compressor with a point of an exhaust gas pipe located upstream of the turbine inlet of the engine turbocharger, the improvement which comprises:

means defining a closed hydraulic circuit;

said closed hydraulic circuit containing:

a volumetric hydraulic pump driven proportionally to the speed of the internal-combustion engine;

a tank for a hydraulic liquid for the hydraulic pump;



an actuating cylinder for the bypass valve;

a hydraulic line for connecting the hydraulic pump with the actuating cylinder;

a throttle line arranged between the hydraulic line and the tank; and

a throttle valve provided with an adjustable flow cross-section provided in said throttle line between said hydraulic line and said tank and serving to control the volumetric flow of the hydraulic liquid through said hydraulic line to said actuating cylinder for the bypass valve.

4,346,560

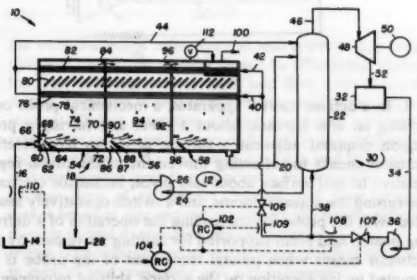
MULTI-STAGE FLASH DEGASER

Pascal M. Rapier, Richmond, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 26, 1980, Ser. No. 163,369

Int. Cl.³ F03G 7/00

U.S. Cl. 60—641.3 **25 Claims**



1. In an energy conversion system having a direct-contact heat exchanger for transfering energy from an elevated temperature fluid, containing noncondensable gases to a working fluid, the improvement comprising means for removing the noncondensable gases from the elevated temperature fluid ahead of the heat exchanger including a flash degaser having;

means for flashing into a gaseous state at least some of the elevated temperature fluid;

means for condensing the gaseous state of the elevated temperature fluid;

means for subcooling the noncondensable gases;

means for venting said noncondensable gases;

means for introducing the elevated temperature fluid into the heat exchanger to transfer energy to said working fluid;

said working fluid being boiled to vapor in said flash degaser; and

means for introducing said vaporized working fluid into said heat exchanger.

4,346,561

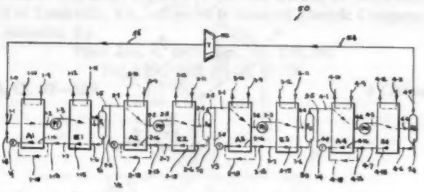
GENERATION OF ENERGY BY MEANS OF A WORKING FLUID, AND REGENERATION OF A WORKING FLUID

Alexander I. Kalina, 12439 Millbanks, Houston, Tex. 77031

Continuation of Ser. No. 92,268, Nov. 8, 1979, abandoned. This application Apr. 24, 1980, Ser. No. 143,524

Int. Cl.³ F01K 25/10

U.S. Cl. 60—673 **32 Claims**



1. A method of generating energy, which comprises expanding a gaseous working fluid from a charged high pressure level to a spent low pressure level to release energy, and regenerating the spent working fluid by, in a plurality of successive regeneration stages:

(a) condensing the working fluid in an absorption stage by dissolving it in a solvent solution while cooling with a cooling medium, the solvent solution comprising a solvent having an initial working fluid concentration which is sufficient to provide a solvent solution boiling range suitable for absorption of the working fluid;

(b) increasing the pressure of the solvent solution containing the dissolved working fluid and evaporating the working fluid being regenerated by heating in an evaporation stage;

(c) feeding the evaporated working fluid to a succeeding regeneration stage;

(d) recycling the balance of the solvent solution remaining after evaporation of the working fluid, to constitute the solvent solution for the absorption stage of that regeneration stage; and

(e) withdrawing regenerated charged working fluid from a final regeneration stage for re-expansion to release energy.

4,346,562

THERMOELECTRIC DEVICE AND PROCESS FOR MAKING THE SAME

Shlomo Beitner, Tel Aviv, Israel, assignor to Bipol Ltd., Tel Aviv, Israel

Filed Dec. 18, 1980, Ser. No. 217,585

Int. Cl.³ F25B 21/02; F25D 3/08

U.S. Cl. 62—3 **19 Claims**

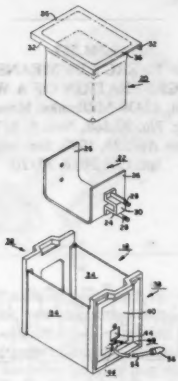
1. In a process for making a thermoelectric device powered by a thermoelectric element of the Peltier type which is held in heat-exchange between an internal thermal sink imbedded in an insulating wall and has an external thermal sink spaced from said insulating wall, and in which electrical connections connect the positive and negative poles of said thermoelectric device with an external power source, the improvement which comprises:

casting said insulating wall of foamed-in-place insulating foam about said inner thermal sink in a manner which provides an outer shell portion on said insulating wall and

a depression therein which exposes a surface of said internal thermal sink;

placing said thermoelectric element in said depression in heat-exchange with the surface of the internal thermal sink exposed by said depression;

placing an annular resilient and compressible sealing gasket on said outer shell portion in position such that it com-



pletely surrounds said depression and the thermoelectric element therein;

placing said external thermal sink in sealing contact with said sealing gasket; and,

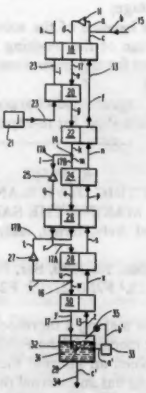
drawing the two sinks toward each other until said gasket is compressed and said thermal sinks are in heat-exchange with said thermoelectric element.

4,346,563

SUPER CRITICAL HELIUM REFRIGERATION PROCESS AND APPARATUS

Charles B. Hood, Columbus, Ohio, assignor to CVI Incorporated, Hilliard, Ohio

Filed May 15, 1981, Ser. No. 266,573
Int. Cl.³ F25B *5/00*
U.S. Cl. 62—117 **10 Claims**



1. A closed loop, supercritical gas refrigeration apparatus comprising:

a. Compressor means to compress a supply of gaseous material to superatmospheric pressure and to force the compressed gaseous material through a refrigerative load,

b. high pressure fluid flow path means to convey substantially all of the compressed gaseous material from the compressor to the refrigerative load, said path means including;

(1) means to divide the gaseous material into two streams,

(2) means to expand the gaseous material in each stream,

(3) means to recombine the two streams, and

(4) means to pass the gaseous material through a cooling bath and the refrigerative load,

c. means to expand and liquify a portion of the gaseous material after it has passed through the refrigerative load,

d. means to introduce the liquid portion of the material into the cooling bath,

e. low pressure fluid flow path means to return the expanded gaseous material from the liquid portion of the material in the cooling bath to the compressor, and

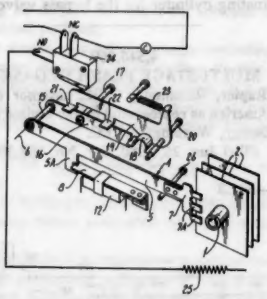
f. heat exchange means arranged to provide heat transfer from the gaseous material flowing in the high pressure fluid flow path means to the gaseous material flowing in the low pressure fluid flow path means, such that the combination of the cooling of the gaseous material in the high pressure fluid flow by expansion, by heat exchange and by the cooling bath forms a stream of cold, supercritical gas which is passed through the refrigerative load.

4,346,564

DEFROSTING CONTROL APPARATUS

Mario Gemma, Linkenheim-Hochstetten, and Burghard Baehr, Berg-Gladbach, both of Fed. Rep. of Germany, assignors to Ranco Incorporated, Dublin, Ohio

Filed Mar. 31, 1980, Ser. No. 135,546
Int. Cl.³ F25D *21/02*
U.S. Cl. 62—140 **14 Claims**



1. In a defrost control apparatus, a mechanical probe comprising an arm movable about a pivot and having a probe region disposed adjacent a surface prone to ice accretion, actuator means for effecting movement of the probe region relative to said surface about said pivot, means for cyclically energising the actuator means, and a switch operatively associated with the probe for controlling the operation of a defrosting heater, said pivot supported for shifting movement by said actuator means when pivotal movement of the probe is obstructed by ice accretion on the surface, shifting movement of said pivot and probe effecting operation of said switch.

4,346,565

GRAVITY DEFROST

William J. McCarty, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jun. 4, 1981, Ser. No. 270,478
Int. Cl.³ F25D *21/06*; F25B *41/00, 47/00*
U.S. Cl. 62—151 **2 Claims**

1. A refrigeration system for use in a reverse air cycle type heat pump, said refrigeration system being of the type having

a refrigerant capable of boiling under relatively low pressure to absorb heat and condensing under relatively high pressure to expel heat comprising:

a compressor casing for containing a high pressure refrigerant, said casing having an inlet port and an outlet port;

a compressor in said casing for compressing said refrigerant in gaseous phase;

a condenser having a first opening in the upper portion and a second opening in the lower portion thereof;

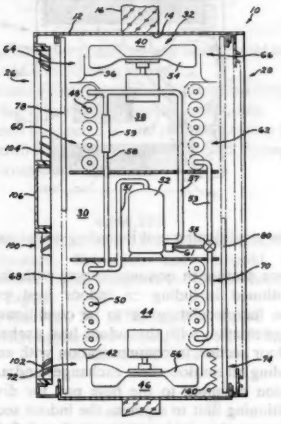
a discharge conduit connecting said condenser first opening to said compressor outlet;

an evaporator arranged above said condenser and said compressor having a first opening in the upper portion and a second opening in the lower portion thereof;

a liquid conduit connecting the second openings in the lower portion in each of said condenser and said evaporator;

a suction conduit connecting said first opening of said evaporator to said compressor inlet;

a means for regulating the flow of refrigerant through said liquid conduit including a flow control means in said liquid conduit, a temperature responsive sensing means for controlling the flow of refrigerant through said flow control means, said temperature responsive means is arranged to sense the temperature of refrigerant in said suction line at a point relative to said compressor wherein



the temperature of refrigerant at said point is in a range that will cause said sensing means to effectively control the flow of refrigerant through said flow control means during operation of said compressor at a flow rate which insures efficient operation of said evaporator and being responsive to the temperature of high pressure refrigerant migrating from said compressor casing to said point when said compressor operation terminates to provide an unrestrictive flow of refrigerant through said flow control means between said second opening in the lower portions in each of said evaporator and condenser;

a defrost flow conduit connected between said first openings in each of said condenser and said evaporator;

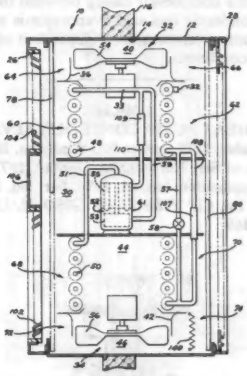
a pressure responsive valve in said defrost flow conduit being operable to a closed position when operation of said compressor creates a refrigerant pressure differential in said refrigeration system, and being operable to an open position when said pressure differential is equalized after said compressor operation terminates, so that a nonrestrictive refrigerant flow path is established through said defrost flow passage between said first opening in the upper portions in each of said condenser and said evaporator and simultaneously through said liquid line between the second openings in the lower portion of said condenser and said evaporator, thereby allowing the warmer gaseous refrigerant, when present in the condenser, to flow from the upper portion of said condenser through said defrost flow conduit into the upper portion of said evaporator to raise the temperature of said evaporator while the temperature of the refrigerant in said suction conduit at said point raised by refrigerant migrating into said line from said compressor sensed by said temperature responsive sensing means causes said flow control means to open to allow the warmed refrigerant in the lower portion of said evaporator to flow unrestricted through said liquid line into the lower portion of said condenser thereby completing an unrestricted defrost circuit between said condenser and evaporator through said liquid line and said defrost flow conduit.

4,346,566

REFRIGERATION SYSTEM GRAVITY DEFROST

William J. McCarty; Walter J. Pohl, and Russell L. McCreary, all of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Jun. 4, 1981, Ser. No. 270,296
Int. Cl.³ F25B *29/00, 47/00*
U.S. Cl. 62—159 **6 Claims**



1. A refrigeration system of the type having a refrigerant capable of boiling under relatively low pressure to absorb heat and condensing under relatively high pressure to expel heat comprising:

a hermetic casing motor, including a compressor driven by said motor for compressing a refrigerant fluid in gaseous phase having an outlet port and an inlet port;

a condenser having a first opening in the upper portion and a second opening in the lower portion thereof;

a discharge conduit connecting said condenser first opening to said compressor outlet;

an evaporator arranged above said condenser and said compressor having a first opening in the upper portion and a second opening in the lower portion thereof;

a liquid conduit connecting the second openings of said condenser and said evaporator;

a suction conduit connecting said evaporator first opening to said compressor inlet;

a flow control means in said liquid conduit;

defrost means including a first defrost flow passage connected parallel with said liquid conduit between said second openings of said evaporator and said condenser, and a second defrost flow passage connecting said first opening of said evaporator and said compressor casing to provide a series flow refrigerant path in series through said discharge conduit, compressor casing, and said second defrost flow passage, a first valve in said first defrost

flow passage and a second valve in said second defrost flow passage;

said first and second valves being operable to a closed position when a refrigerant pressure differential is present in said system and being operable to an open position when said pressure differential is bled down through said flow control means after said compressor operation terminates, so that a nonrestrictive refrigerant defrost flow path circuit is established bypassing said flow control means through said first defrost flow passage between the second opening in the lower portions of said condenser and said evaporator and through said second defrost flow passage between said first openings of said condenser and evaporator through the compressor casing, thereby allowing liquid refrigerant when present in the lower portion of said evaporator to flow through said first defrost flow passage into the lower portion of said condenser, while the warmer gasous refrigerant will flow through said second defrost flow passage from the condenser forst opening in the upper portion of said condenser through the compressor casing into the evaporator first opening in the upper portion of said evaporator to raise the temperature of said evaporator and melt frost when present;

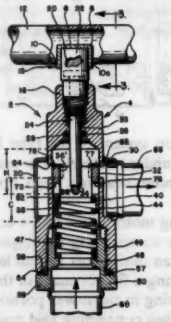
control means including resistance means for raising the temperature of refrigerant in said compressor casing to a predetermined value to insure that the refrigerant flowing through the compressor casing between the first opening of said condenser and said evaporator is maintained at a predetermined temperature independent of ambient temperature conditions.

4,346,567

HEAT PUMP CONTROL VALVE

David H. Snaider, 1225 Spruce St., Winnetka, Ill. 60093

Continuation of Ser. No. 860,592, Dec. 14, 1977, abandoned.
This application Jan. 31, 1980, Ser. No. 117,076
Int. Cl.³ F25B *13/00*; G05D *23/12*
U.S. Cl. 62—160 15 Claims



1. In a heat pump system for selectively heating and cooling a room, the system including a compressor, first and second heat exchangers each of which being connected to the compressor and to each other, a refrigerant line for conducting a refrigerant fluid to said first and second heat exchangers, the refrigerant line connecting the compressor and said first and second heat exchangers so as to form a closed circuit,

said first heat exchanger serving as an evaporator in a cooling cycle and as a condenser in a heating cycle, said second heat exchanger serving as a condenser in a cooling cycle, and as an evaporator in a heating cycle, and

a line for conducting water to and through said second heat exchanger, the water serving as a heat exchange medium therein in addition to the refrigerant fluid,

the improvement which comprises valve means responsive to temperature variations in the refrigerant line connecting said first and second heat exchangers for selectively regulating the flow of water in the water line leading to said second heat exchanger,

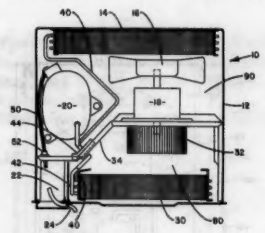
said valve means comprising a self-regulating valve for controlling the flow of water into the water line by varying the size of the orifice of the latter, said self-regulating valve being provided with temperature sensing means extending directly into the refrigerant line, the orifice of the water line being partially open at all times, so as to allow time for the temperature sensing means to sense the refrigerant temperature and to allow said self-regulating valve to position itself correctly relative to the orifice of the water line.

4,346,568

METHOD AND APPARATUS FOR SECURING TUBES IN AN AIR CONDITIONING UNIT

Terrence J. Perrone, Rochester; Theodore S. Bolton, Liverpool, and Cosimo Caronna, Syracuse, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed May 18, 1981, Ser. No. 264,910
Int. Cl.³ F25D *23/12*
U.S. Cl. 62—259.1 11 Claims



1. An air conditioning unit including a base pan which comprises:

an indoor section in communication with the space to be conditioned including an indoor heat exchanger and means for circulating air to be conditioned in heat exchange relation with the indoor heat exchanger;

an outdoor section in communication with ambient air and including an outdoor heat exchanger and a compressor;

a partition mounted to the base pan for dividing the air conditioning unit to separate the indoor section from the outdoor section, said partition further defining a partition opening;

a refrigerant carrying line extending between the indoor section and the outdoor section through the partition opening; and

a block of sealing material, said block defining at least one slit for engaging a portion of the partition at the partition opening and a line receiving slit for receiving the refrigerant carrying line, said block including excess material whereby upon the assembly of the partition to the base pan the partition opening is fully sealed with the refrigerant carrying line extending therethrough.

4,346,569

NATURAL ICE FOR COOLING ENERGY

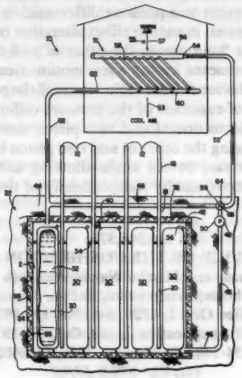
Shao W. Yuan, 6701 Montour Dr., Falls Church, Va. 22043

Continuation-in-part of Ser. No. 951,518, Oct. 13, 1978, Pat. No. 4,240,268. This application Dec. 22, 1980, Ser. No. 218,800
The portion of the term of this patent subsequent to Dec. 23, 1997, has been disclaimed.
Int. Cl.³ F25D *23/12*
U.S. Cl. 62—260 12 Claims

1. A system for extracting, transmitting, storing, recovering and utilizing cold, said system comprising:

a. apparatus for extracting cold from the environment;

b. transmitting means comprising a heat pipe for transmitting said cold from environment above the ground to a location below the surface of the ground;
c. storage means for storing cold including containers of freezable liquid submerged in liquid coolant, said containers and liquid coolant being located at said location below the surface of the ground for receiving and storing cold transmitted thereto by said transmitting means;
d. recovery means for recovering cold from said storage means and delivering it to a second environment; and
e. utilizing means connected to said recovery means for receiving cold therefrom and dispersing said cold throughout said second environment.

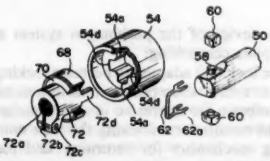


4,346,570

NOISE RESISTANT UNIVERSAL JOINT

Toshiaki Nakamura, Kawasaki, and Naoyuki Kuramoto, Fujisawa, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 30, 1979, Ser. No. 98,884
Claims priority, application Japan, Dec. 11, 1978, 53-170832
Int. Cl.³ F16D *3/18*
U.S. Cl. 464—120 **4 Claims**



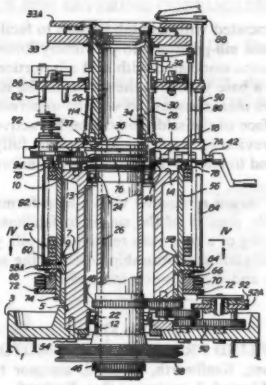
1. A universal joint for connecting first and second shafts, comprising:
a tubular housing having oppositely disposed first and second end openings and internal angularly spaced elongated grooves extending axially from said first opening end into communication with an internal circular groove at said second opening end;
a first shaft received in the first end opening of said housing, means cooperatively engageable with some of said internal elongated grooves for coupling the first shaft to said housing,
a generally tubular connecting member having one end adapted to be received on and detachably secured to an end of the second shaft, the opposite end of said connecting member being received in the second end opening of said housing and having axially extending pegs loosely received in other of said internal elongated grooves; and,
a resilient noise vibration absorbing member tightly surrounding the external surface of said connecting member and fixed relative to the base of said internal circular groove.

4,346,571

CIRCULAR KNITTING MACHINES

Arrigo Micheletti, 3, Viale Papa Giovanni XXIII°, Fucecchio, Firenze, Italy

Filed Jul. 3, 1980, Ser. No. 165,697
Claims priority, application Italy, Jul. 9, 1979, 9480 A/79
Int. Cl.³ D04B *15/32, 15/00*
U.S. Cl. 66—55 **3 Claims**

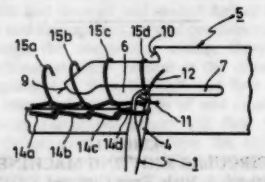


1. In a circular knitting machine, a needle cylinder with needles and jack butts carried by the needle cylinder, yarn guides, a plurality of control members for the needles and jack butts, a cam drum coaxial with the needle cylinder, a ratchet system, including a pawl, for driving the cam drum, programming means which can be advanced in relation to the rotation of the needle cylinder, said programming means comprising a program drum coaxial with the needle cylinder and the cam drum being independent thereof, said drum having programming members which can be changed, a drive system synchronised with the motion of the needle cylinder for advancing slowly the program drum, a ratchet system which determines the length of the programs and the re-phasing, and is operative to effect rapid advancement of the program drum, said system being able to be combined with the ratchet drive system of the cam drum, follower means arranged to activate and deactivate said ratchet systems, a manual control arranged to activate the rapid advancement re-phasing ratchet system for the program drum until this latter reaches a zero position at which the rapid advancement of said program drum ceases, a member disposed in the zero position of the program drum to activate the cam drum pawl until the cam drum is also moved into the zero position, and a cam in the zero position on the cam drum to control the initial slow advancement of the program drum when both the drums reach an in-phase zero position.

4,346,572
APPARATUS FOR KNITTING A SINGLE-FACED PILE FABRIC

Jose M. D. Güell, Barcelona, Spain, assignor to Jumberca, S.A., Badalona, Spain

Division of Ser. No. 904,875, May 11, 1978, Pat. No. 4,194,374.
This application Jun. 29, 1979, Ser. No. 53,273
Claims priority, application Spain, Jun. 3, 1977, 459450
Int. Cl.³ D04B 9/12, 15/06
U.S. Cl. 66—93 10 Claims



1. A sinker having a nib portion and a belly portion defining upper and lower yarn introduction levels, the said lower level including a yarn receiving throat and a horizontal extention thereto;

means associated with said nib portion to facilitate the reentry of said nib portion into previously formed pile loops;

further means associated with said nib portion to guide the path of a base yarn into the throat of the sinker;

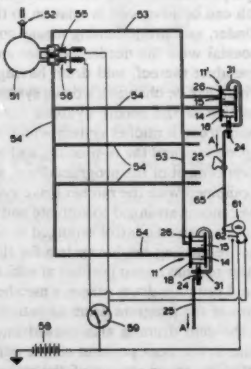
still further means associated with an uppermost loop forming surface of the said nib portion for active engagement with previously formed pile loops to fully extend said loops and to reform them to loops of uniform pile height; and

additional means associated with a loop forming surface of said belly portion of the sinker to facilitate the positive positioning of a base yarn relative to a pile yarn to insure a precise plating relationship between the said two yarns prior to and during stitch formation.

4,346,573
FLUID PRESSURE SERVOMOTOR

David Parsons, Kenilworth, England, assignor to Automotive Products Limited, Leamington Spa, England

Filed Oct. 10, 1979, Ser. No. 83,223
Claims priority, application United Kingdom, Oct. 12, 1978, 40375/78
Int. Cl.³ E05B 53/00, 51/00
U.S. Cl. 70—264 8 Claims



1. A fluid pressure servo motor comprising:

a stationary body;

two co-axial fluid chambers defined within the body and which are separated by a partition wall and are operatively independent;

a pair of co-axial piston means;

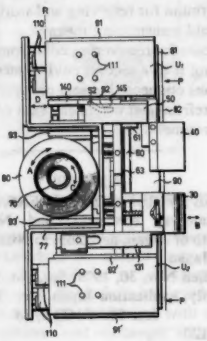
each of said piston means being located in a respective one of said chambers and being movable towards the partition wall in response to a pressure differential in the respective chamber, so as, in use, to effect alteration of a two condition device from one to the other of said conditions and each piston means having a lost motion means connection with said device to allow idle return of the piston means in the event of cessation of the pressure differential; and

a stirrup fixed to one of said two piston means and operatively bridging the other of said two piston means to act in use against said device while allowing said other piston means to move axially independently of the stirrup.

4,346,574
LOCK DEVICE OF THE PUSHBUTTON SYSTEM

Katori Nakamura, and Hisako Nakamura, both of No. 18-17, Okuzawa 6-chome, Setagaya-ku, Tokyo, Japan

Filed Oct. 1, 1980, Ser. No. 194,893
Claims priority, application Japan, Oct. 17, 1979, 54-133758; Nov. 17, 1979, 54-148329; May 16, 1980, 55-64022
Int. Cl.³ E05B 37/00
U.S. Cl. 70—313 12 Claims



1. A lock device of the pushbutton system attached to a casing base plate comprising:

at least one lock unit adapted to permit a locking and unlocking bar to rotate when pushbuttons of a number r out of a total number n are depressed in such a manner as to meet the requirements for unlocking the lock unit;

a resetting mechanism for returning said lock unit to a standby position by one reciprocating movement of a reset lever performed by turning a knob;

a locking and unlocking pawl member formed in a rotatable locking and unlocking member which is connected to said locking and unlocking bar of said lock unit;

an intermediate slider which can be reciprocated through a driving slider by turning a grip for opening and closing the door;

a dead bolt which is movable between a lock position and an unlock position, in the movable direction of said intermediate slider, said dead bolt being partly superimposed on said intermediate slider;

a notch which is formed in said intermediate slider in a portion where said intermediate slider and said dead bolt are superimposed on each other;

a notch which is formed in said dead bolt at a position slider;

a control slider which is in engagement with said locking and unlocking pawl member, said control slider being situated above the superimposed portion of said intermedi-

ate slider and said dead bolt and movable in the same direction as that of said intermediate slider when said intermediate slider is moved;

a seesaw member having a control pin at one end thereof, said seesaw member disposed in said control slider and said control pin capable of being brought into engagement with said notches of said intermediate slider and said dead bolt and released from engagement with the same;

a sub-control slider which is disposed adjacent said control slider, said sub-control slider movable in the same direction as that of said intermediate slider, between a forwardly projecting position and a rearwardly withdrawn position, and also independently movable from the forwardly projecting position to the rearwardly withdrawn position and vice versa by an operation from inside the room; and

a control projection which is disposed in said sub-control slider, said control projection capable of holding said seesaw member at a position where said control pin is in engagement with said notch of said intermediate slider and with said notch of said dead bolt when said sub-control slider is located at the forwardly projecting position, and also capable of holding said seesaw member at a position where said control pin is out of engagement with said notch of said intermediate slider and with said notch of said dead bolt when said sub-control slider is located at the rearwardly withdrawn position.

4,346,575

METHOD OF WIDTH CONTROL IN HOT STRIP MILL

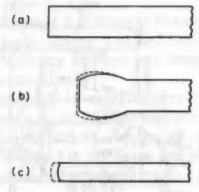
Takashi Shibahara, Osaka; Teruo Kohno, Nishinomiya, and Yoshisuke Misaka, Takarazuka, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

PCT No. PCT/JP79/00264, § 371 Date Sep. 8, 1980, § 102(e) Date Sep. 8, 1980, PCT Pub. No. WO81/01114, PCT Pub. Date Apr. 30, 1981

PCT Filed Oct. 19, 1979, Ser. No. 253,630

Int. Cl.³ B21B *13/16, 37/12, 37/10*

U.S. Cl. 72—16 **1 Claim**



1. A method for controlling the width of material in hot strip rolling through a train of roughing roll stands in which a plurality of vertical roll stands and a plurality of horizontal roll stands are arranged in series and alternately one after another, said method comprising the steps of (1) measuring the width of a material to be rolled over at least the entire middle area out of the entire longitudinal area thereof at the delivery side of any one of the horizontal roll stands disposed intermediately in said train of roughing roll stands; (2) deriving values of the variations in width of the respective portions in the longitudinal direction based on the values of the width measured during said measuring step; (3) calculating a reference coefficient of width spread based on empirically derived data reflective of the rolling conditions of said horizontal and vertical roll stands; (4) determining respective local coefficients of width spread due to bulging at the lateral marginal portions of the material to be rolled for at least all the middle area out of the entire longitudinal area of the material to be rolled based on (a) said values of the variation in width, (b) the degree of width reduction at each of the vertical roll stands upstream of the measuring point and (c) said reference coefficient of width spread; (5) after step (4), calculating the required amount of modification to be applied for screwdown over at least the entire middle area of said material in order to reduce to zero the expected variation in width in the portions of material downstream of the places of the measurement based on the local coefficient of width spread due to respective bulgings, (b) the amount of width reduction at each of the vertical roll stands located downstream of the vertical roll stand where the opening thereof is to be controlled, (c) said reference coefficient of width spread due to bulging and (d) said values of width variation at the respective portions; and (6) controlling the opening of at least one of the vertical roll stands located downstream of said place of measurement so that said required amount of modification for screwdown is applied over at least the entire middle area out of the entire area of said material to be rolled.

4,346,576

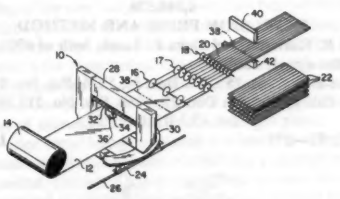
APPARATUS FOR SEVERING CORRUGATED METAL PRODUCTS

Eugene W. Sivachenko, 6471 Riverside Dr., Redding, Calif. 96001

Continuation of Ser. No. 932,253, Aug. 9, 1978, abandoned. This application Jul. 14, 1980, Ser. No. 167,942

Int. Cl.³ B21C *37/12*

U.S. Cl. 72—49 **29 Claims**



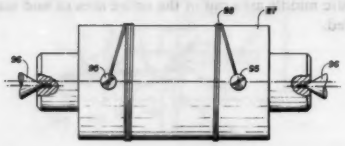
1. Apparatus for forming corrugated metal product from a substantially flat metal sheet comprising in combination: a corrugator having a plurality of cooperating sets of first and second corrugating rolls arranged so that the sheet, when passed between the rolls, is longitudinally deformed to define parallel, longitudinally extending, side-by-side corrugations; means for advancing the sheet past the roll sets to thereby longitudinally corrugate the sheet; means for forming a transverse score line in the sheet extending from a first face of the sheet towards a second, opposite face thereof including; a platform movable in the direction of travel of the sheet and positioned proximate the sheet and upstream of the corrugator, means for connecting the platform with the sheet so that the platform moves with the same speed as the sheet; and means located on the platform for scoring the sheet across its width from one edge of the sheet to the other edge thereof as the platform moves with the sheet; and means located downstream of the corrugator for and means located downstream of the corrugator for applying a force acting transversely to the faces of the corrugated plate in the vicinity of a score line; whereby the corrugated metal product is severed from a remainder of the sheet in the form of a length of corrugated plate.

5. Apparatus according to claim 1 including a pair of rails oriented parallel to the direction of travel of the sheet upstream of the corrugator, and wherein the platform slides along the rails so as to be movable in the direction of travel of the sheet.

4,346,577
METHOD FOR PRODUCING CURVED VALVE NEEDLES

Klaus-Jürgen Peters, Affalterbach; Rudolf Krauss, Stuttgart, and Ernst Binggeser, Asperg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 18, 1980, Ser. No. 170,224
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1979, 2934217
Int. Cl.³ B24B *19/16*; F02M *69/00*; B21F *3/04*
U.S. Cl. 72—129 **7 Claims**



1. A method for producing a curved valve needle which comprises:

winding a spring-like wire of uniform contour around a mandrel to form a coil of separate side-by-side windings and securing each end of the coil to said mandrel.

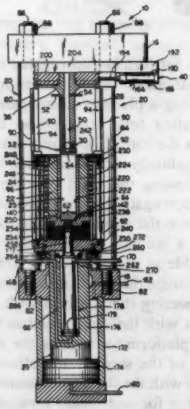
grinding down said spring-like coil lengthwise of said mandrel such that the contour of each winding is similarly ground down along its circumference from a thinnest point in each direction to its normal uniform contour, and

cutting each winding at its thinnest ground down point and at a point 180° therefrom to provide two similar curved valve needles.

4,346,578
EXTRUSION PRESS AND METHOD

Nelson K. Harrison, and Dana B. Lamb, both of 6901 W. 30th St., Berwyn, Ill. 60402

Division of Ser. No. 755,747, Dec. 30, 1976, Pat. No. 4,308,742. This application Dec. 22, 1980, Ser. No. 218,353
Int. Cl.³ B21C *23/21*
U.S. Cl. 72—271 **11 Claims**

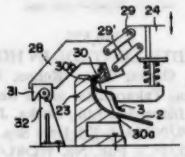


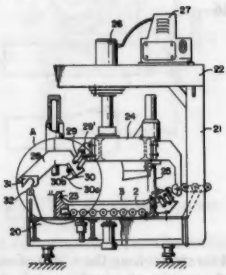
1. Apparatus for extruding high strain rate sensitive metal, said apparatus including a first platen, a receiver for receiving a to-be-extruded metal billet, said receiver being mounted on the platen, a second platen, a ram mounted on the second platen and extending towards said receiver, said ram having means for mounting an extrusion die at one end for extruding metal from within the receiver, tie rods holding the platens against separating movement by the forces generated due to the extrusion action, said tie rods taking the thrust which is exerted due to the extrusion action, said rods being pre-tensioned with a tension that is greater than the forces that will be exerted on them by the aforementioned thrust, and compression columns paralleling the respective rods and constituting stops taking the thrust of the pretension of the rods and determining the spacing between the platens, characterized by the fact that the columns are of cast iron and of a cross sectional area such that their reduction in length due to the thrust exerted on them by the pretension of the tie rods is negligible so that during the extrusion action there is no more than negligible changes in the position of the stop portion of each compression column due to changes in thrust pressure exerted upon the column by the tie rods.

4,346,579
HEMMING APPARATUS

Huehiro Takatsu, c/o Kabushiki Kaisha Takatsu Seisakusho, 22, 3-chome, Nanabancho, Minato-ku, Nagoya-shi, Aichi-ken, Japan

Filed Mar. 14, 1980, Ser. No. 130,528
Claims priority, application Japan, Mar. 15, 1979, 54-30418
Int. Cl.³ B21D *5/04, 5/16, 11/00*
U.S. Cl. 72—314 **7 Claims**





1. A hemming apparatus comprising a lower body, a bottom form mounted on said lower body, an upper body mounted on said lower body and vertically movable with respect to said lower body so as to clamp a work intermediate said bottom form and said upper body, a main hemming means, a pair of links connecting said main hemming means to said upper body, which operate as a parallel linkage in a vertical direction, and inclined downwardly to the main hemming means from the upper body, a bending blade attached to said main hemming means and comprising integrally formed bending blade members one of which is used for a preliminary bending of the work and the other of which is used for a primary bending of the work, a guide attached to said lower body and a shifting cam attached to said main hemming means and engageable with said guide so as to shift said main hemming means laterally with respect to the vertical movement in accordance with the downward movement of said upper body and the movement of said links wherein means is provided for raising the upper body to an extent that said main hemming means is in spaced, non-

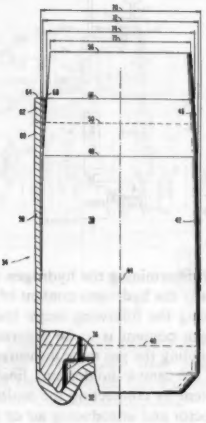
contacting relation to said guide, said guide coming into engagement with said shifting cam to move said main hemming means such that said preliminary bending blade member is applied to the work at an angle with respect to the surface to be hemmed and such that said primary bending blade member is positioned parallel to the surface of the bottom form when the work is in its final bent stage.

4,346,580

MANUFACTURE OF LIGHTWEIGHT DRAWN AND IRONED CAN BODIES

William T. Saunders, Weirton, W. Va., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Aug. 26, 1980, Ser. No. 181,467
Int. Cl.³ B21D *45/00*
U.S. Cl. 72—344 **8 Claims**



1. Structure for forming lightweight flat-rolled sheet metal into a unitary can body having a closed bottom wall and an elongated sidewall defining an open end longitudinally opposite to the closed bottom wall,

the elongated sidewall of such unitary can body being formed by ironing in which sidewall metal of a seamless unitary cup-shaped article, having an open end and a closed end, is reduced in thickness and elongated by passage of the cup-shaped article through a plurality of ironing rings,

comprising

an elongated, plunger-type ironing mandrel,

such mandrel including

a work input end adapted to be supported by machine structure for providing ironing force,

a central longitudinal axis,

an external sidewall radially spaced from the central longitudinal axis so as to present a substantially circular configuration in a plane perpendicular to the central longitudinal axis, and

a terminal end longitudinally opposite to the work input end,

such terminal end defining a bottom wall configuration for contacting the interior surface at the closed end of the cup-shaped article,

the external sidewall of such ironing mandrel presenting a preselected surface configuration for formation of the can body sidewall during ironing,

the configuration of such mandrel external sidewall surface being preselected along its longitudinal length from a location contiguous to the terminal end to a predetermined location contiguous to the work input end of such mandrel,

such preselected configuration sidewall surface including

a main body portion extending over a major portion of the longitudinal length of such mandrel from its terminal end toward its work input end, and

a transition zone extending longitudinally from such main body portion toward the work input end,

the exterior sidewall surface of the ironing mandrel transition zone presenting a uniformly tapered surface extending longitudinally of the ironing mandrel,

the tapering of such transition zone surface being such that the exterior diameter of the ironing mandrel beyond the main body portion and extending in the direction of the work input end is uniformly decreased in relation to a main body portion of the ironing mandrel which presents the largest diameter dimension of the preselected surface configuration of the ironing mandrel,

a trim height plane which is perpendicular to the central longitudinal axis of the mandrel establishes a location along the length of the ironing mandrel corresponding to the desired height of an ironed can body after trimming subsequent to ironing and stripping of the formed can body from the mandrel,

the transition zone tapered surface being located at such trim height plane and extending in longitudinally opposite directions from such trim height plane,

the transition zone tapered surface having a predetermined angular relationship to the central longitudinal axis of the ironing mandrel,

such predetermined angular relationship and location of such transition zone surface being selected such that:

the sidewall of a can body being ironed has a greater thickness than the main body portion sidewall thickness in approaching such trim height plane to provide desired flanging metal thickness at the trim height plane, and

ironing of the can body sidewall extends beyond such trim height plane so that sidewall metal expires along such transition zone tapered surface beyond the trim height plane in the longitudinal direction of the work input end of the mandrel so as to present edge metal at the open end of the ironed can body of a thickness greater than that of sidewall metal at the trim height plane,

such edge metal being presented at a location where such transition zone continues establishing a tapered exterior mandrel contact surface extending toward the work input end of the mandrel, such contact surface being of smaller diameter than that existing at the edge metal location.

4,346,581

APPARATUS FOR MANUFACTURING FITTINGS

Hiroyuki Ando, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 17, 1980, Ser. No. 198,213
Claims priority, application Japan, Oct. 18, 1979, 54-133609
Int. Cl.³ B21D *22/00*
U.S. Cl. 72—347 **4 Claims**

1. An apparatus for manufacturing fittings, comprising:

a bed;

a lower die mounted on said bed, said lower die having formed therein a stepped bore adapted to receive a cylindrical blank to be worked;

a hollow knockout slidably mounted in said stepped bore;

a slide;

holder means fixedly secured to said slide, said holder means having a first bore formed therein;

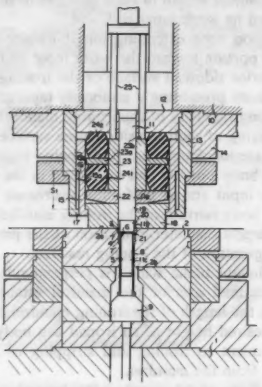
a cylindrical member slidably fitted in said holder means;

an upper die mounted in said cylindrical member, said upper die having a second bore formed therein;

a punch fixedly secured to said slide and inserted in the first and second bores of said holder means and said upper die;

a sleeve mounted on and around said punch;

cushion cylinder means for biasing said sleeve and said upper die downwards; and



elastomer means disposed around said sleeve between said holder means and said upper die for biasing said upper die downwards after said upper die is lowered on said lower die.

4,346,582

METHOD FOR FLATTENING CORRUGATED HEAT EXCHANGER PLATES

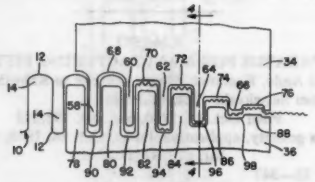
John M. Bailey, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00082, § 371 Date Jan. 28, 1980, § 102(e) Date Jan. 28, 1980, PCT Pub. No. WO81/02121, PCT Pub. Date Aug. 6, 1981

PCT Filed Jan. 28, 1980, Ser. No. 165,831

Int. Cl.³ B21D *13/02, 37/08, 43/02, 53/04*

U.S. Cl. 72—379 **6 Claims**



1. A method for crushing a portion of corrugated sheet in an area extending transversely to the corrugations thereof without blocking the passages between the ridges of the uncrushed portion of said corrugated sheet which includes the steps of inserting a spacing member into each of the passages on both sides of at least one ridge of said corrugated sheet in a transition area in the area to be crushed located between the uncrushed portion of said corrugated sheet and the remainder of the area to be crushed, crushing the ridge in the area between the spacing members, withdrawing the spacing members, subsequently crushing the remainder of the area to be crushed without the use of spacing members.

4,346,583

METHOD AND APPARATUS FOR DETERMINING THE HYDROGEN CONTENT OF A GAS

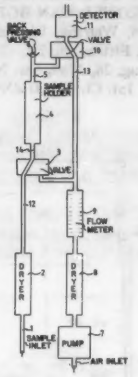
Herman M. Hoogstraat, 10 Passeweg 8, 8084 AN'tHarde, Netherlands

Filed Jun. 6, 1979, Ser. No. 45,879

Claims priority, application Netherlands, Jun. 12, 1978, 7806340

Int. Cl.³ G01N *31/00*

U.S. Cl. 73—19 **3 Claims**



1. A method for determining the hydrogen content of a gas and more specifically the hydrogen content of a person's expiratory air comprising the following steps: leading the gas of which the hydrogen content is to be determined through a sample-holder, sampling the gas to be measured by closing the outlet and inlet of the sample-holder and, finally, determining the hydrogen content by connecting the outlet of the sample-holder with a detector and introducing air or another gas at a fixed rate at a predetermined overpressure into the inlet of the sample-holder, so as to drive the contents of the sample-holder i.e. the gas-sample through the detector at a fixed rate.

4,346,584

GAS ANALYZER

John R. Boehringer, 427 Parkview Dr., Wynnewood, Pa. 19096

Filed Oct. 20, 1980, Ser. No. 199,110

Int. Cl.³ G01N *31/06*

U.S. Cl. 73—23 **25 Claims**

1. Gas analyzer comprising:

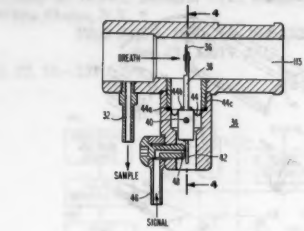
(a) a volumetric gas sampling means comprising a gas receiving cylinder and piston;

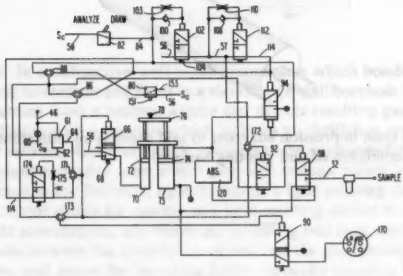
(b) sampling means actuator for reciprocally driving said sampling means piston;

(c) means for triggering said actuator;

(d) valve means for selectively connecting said sampling means to a source of said sample gas, during the sample phase of operation of said analyzer, or to a closed recycle circuit including an absorber for a gas, the content of

which in said sample gas is to be measured during the analyze phase of operation of said analyzer; and





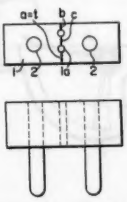
(e) means for comparing the volume of sample gas in said recycle circuit before and after passage of said gas through said recycle circuit and absorber.

4,346,585

GAS DETECTOR

Eturo Yasuda; Yoshihiro Segawa, both of Okazaki, and Minoru Ohta, Anjo, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Division of Ser. No. 958,681, Nov. 8, 1978, Pat. No. 4,287,751. This application Dec. 4, 1980, Ser. No. 213,104
Claims priority, application Japan, Nov. 9, 1977, 52/134259
Int. Cl.³ G01N *27/04*
U.S. Cl. 73—23 **4 Claims**



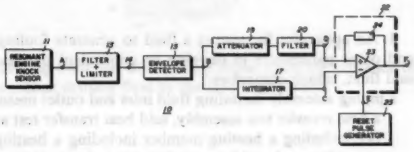
1. A gas detector comprising: a pair of electrodes; and a gas detector element comprising a sintered metal oxide block having two parallel opposed rectangular surfaces, said block having an electrical resistance that is a function of a gas to be detected, said electrodes being parallel to one another, normal to a lengthwise axis thereof, lying in a plane disposed centrally between and parallel to said surfaces, spaced a first predetermined distance apart, and embedded in and extending substantially through said block from one side to an opposing side to define a portion thereof, said portion having at least one notch disposed at said surface and extending therethrough, forming a further portion therebetween, said further protion extending substantially therethrough and of a predetermined thickness less than 0.6 millimeters for shortening the penetration time therethrough of said gas.

4,346,586

ENGINE KNOCK SIGNAL PROCESSING CIRCUIT

John H. Furrey, Schaumburg, Ill., assignor to Motorola Inc., Schaumburg, Ill.

Filed Jul. 22, 1980, Ser. No. 171,230
Int. Cl.³ G01L *23/22*; F02P *5/04*
U.S. Cl. 73—35 **9 Claims**



1. An analog engine knock signal processing circuit comprising:

engine knock sensor means for providing an analog engine knock signal representative of engine knock and engine background noise;

detector means, including a rectifier means, coupled to said knock sensor means for receiving and rectifying said knock signal and developing an envelope output signal, at an envelope terminal, representative of the peak magnitude signal envelope of the knock signal;

integrator means coupled to said envelope terminal for receiving and integrating said envelope signal and providing an average signal related to the average magnitude of said envelope signal, said average signal being provided at an average terminal, the amplitude of said average signal having a first response time in response to amplitude changes in said envelope signal,

attenuator means coupled to said envelope terminal for receiving said envelope signal and providing an amplitude attenuated signal related to a predetermined amplitude attenuation of said envelope signal, the amplitude of said attenuated signal responding to changes in the magnitude of said envelope signal faster than the amplitude of said average signal, said attenuator means including circuitry for adjusting the amplitude of said attenuated signal to less than the amplitude of said average signal for constant amplitudes of said envelope signal; and

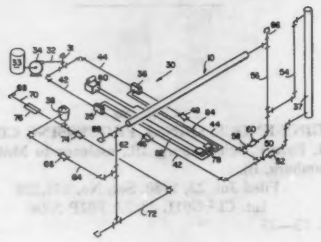
comparator means coupled to both said integrator means and said attenuator means for receiving both said average signal and said attenuated signal and providing a knock detection output signal at an output terminal in response to the amplitude of a faster responding signal derived from said attenuated signal exceeding the amplitude of said average signal, whereby by adjusting the amount of attenuation of said attenuator means, desired knock detection characteristics of the signal processing circuit for varying amplitudes of engine background noise can be readily obtained and by using the envelope signal some immunity from falsely detecting short duration engine noise spikes as engine knock is obtained.

4,346,587

PROCESS AND APPARATUS FOR TESTING FLUIDS FOR FOULING AND ANTIFOULANT PROTOCOL

Nicholas J. Brindak, Morris Plains, N.J., assignor to Drew Chemical Corporation, Boonton, N.J.

Filed Oct. 30, 1980, Ser. No. 202,352
Int. Cl.³ G01N *17/00*
U.S. Cl. 73—61.2 **18 Claims**



1. An apparatus for testing a fluid to generate fouling data and other parameters to develop an antifoulant protocol for said fluid, which comprises:

a piping assembly including fluid inlet and outlet means and a heat transfer test assembly, said heat transfer test assembly including a heating member including a heating element disposed within a conduit means having a passageway for said fluid;

means for measuring temperature of said fluid entering said heat transfer test assembly;

means for supplying electrical energy of a pre-select quantity to said heating element;

means for measuring a wall temperature of said heating element;

flow means for measuring velocity of said fluid through said conduit means;

means for generating fouling data from said pre-select quantity of electrical energy supplied to said heating element, said measured temperature of said fluid and said measured wall temperature of said heating member; and

means for introducing an antifoulant into said fluid.

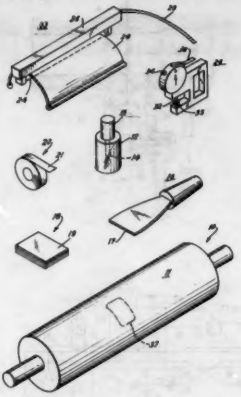
4,346,588

REPRODUCING SURFACE TESTING METHOD AND APPARATUS

Douglas E. Tuttle, 1000 Mary Allen La., Mountainside, N.J. 07092

Filed Dec. 22, 1980, Ser. No. 218,341
Int. Cl.³ G01B *5/28*
U.S. Cl. 73—105 **9 Claims**

1. The method of measuring the condition and volume of a recessed reproducing surface comprising the steps of applying a fluid resin to an area of said reproducing surface to substantially fill the recesses within said areas, superimposing on and beyond said area a non-fibrous transparent flexible sheet adherent to said resin, solidifying said resin to form a solid impression, separating said sheet from said surface with said resin impression adherent thereto and determining the thickness of



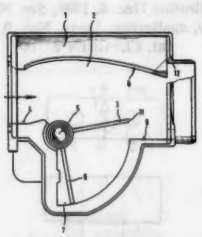
said resin impression adherent to said sheet as an indication of the condition of said printing surface.

4,346,589

FLOW RATE METER

Wolfgang Kienzle; Werner Paschke, both of Schwieberdingen, and Erwin Nägele, Hessigheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 19, 1980, Ser. No. 188,437
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1979, 2944469
Int. Cl.³ G01F *1/28*
U.S. Cl. 73—118 **3 Claims**

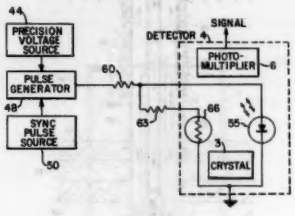


1. A flow rate meter having a housing and an air medium flow measuring device disposed in a flow channel between an inlet end and an outlet end, said measuring device being pivotable about a support shaft in accordance with the quantity of air medium flowing therethrough and counter to a restoring force, said measuring device arranged to measure the quantity of air medium aspirated by an internal combustion engine via an air intake tube, characterized in that said flow channel has a first abruptly enlarged cross section immediately downstream of said measuring device and a second abruptly enlarged cross section adjacent said outlet end downstream of said first abruptly enlarged cross section in order to influence the characteristic curve of the flow rate meter.

4,346,590
GAIN STABILIZATION FOR RADIOACTIVITY WELL LOGGING APPARATUS

Winthrop K. Brown, Bellaire, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Sep. 2, 1980, Ser. No. 182,899
Int. Cl.³ G01V 5/12
U.S. Cl. 73—151 7 Claims



1. In a radioactive well logging apparatus which bombards earth formations and fluids in a vicinity of a well borehole with neutrons from a neutron source and detects resulting gamma radiation with a detector which includes a scintillation crystal for emitting flashes of light in response to the gamma radiation, a photomultiplier tube which provides voltage pulses in response to the flashes of light furnished, a light emitting diode, oscillator means for causing said light emitting dioded to emit light scintillations, and means for mounting said light emitting diode between the scintillation crystal and the photomultiplier tube, said means for mounting further optically coupling light scintillations from said light emitting diode for gain stabilization and said scintillation crystal to said multiplier tube for well logging, an improvement comprising:

temperature sensing means, and

means connected between the light emitting diode and the oscillator means and to the temperature sensing means and being responsive to the temperature sensing means for maintaining the intensity of light emitted by the light emitting diode as the temperature changes.

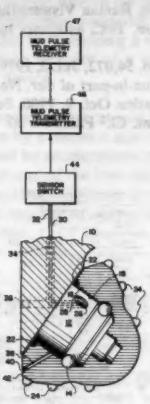
4,346,591
SENSING IMPENDING SEALED BEARING AND GAGE FAILURE

Robert F. Evans, 631 Honeywood La., La Habra, Calif. 90631

Filed Aug. 21, 1981, Ser. No. 295,025
Int. Cl.³ G01M 3/16
U.S. Cl. 73—151 20 Claims

1. In a drilling tool having a sealed and lubricated bearing assembly, means for sensing the admission of aqueous drilling fluid to a lubricant cavity of the bearing assembly, comprising, in combination:

means communicating with the lubricant cavity of the bearing assembly, and activated upon the presence of aqueous

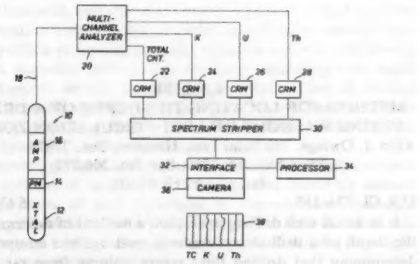


drilling fluid, for delivering a signal upon the presence of aqueous drilling fluid in the lubricant cavity.

4,346,592
METHOD FOR DETERMINING EFFECTIVE RESERVOIR POROSITY

Walter H. Fertl, Houston, Tex., and Marvin R. DeVries, Tulsa, Okla., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 18,686, Mar. 6, 1979, abandoned. This application Sep. 3, 1980, Ser. No. 183,772
Int. Cl.³ E21B 49/00
U.S. Cl. 73—152 15 Claims



12. A method for determining the effective porosity of earth formations traversed by a borehole within a geologic region; comprising:

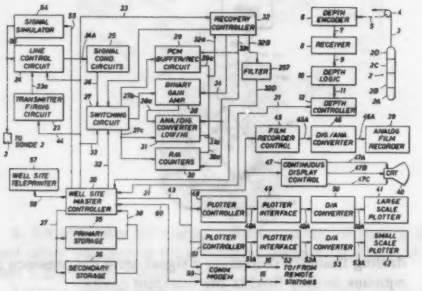
deriving measurements functionally related to the shaliness of said earth formations traversed by said borehole; and

combining said shaliness measurements with a compaction trend for said geologic region to provide an indication of the effective porosity of said earth formations.

4,346,593
WELL LOGGING CORRECTION METHOD AND APPARATUS

Anthony P. S. Howells; Raman Viswanathan, and Jorg A. Angehrn, all of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 54,072, Jul. 2, 1979, Pat. No. 4,297,879, which is a continuation-in-part of Ser. No. 949,592, Oct. 10, 1978. This application Oct. 9, 1980, Ser. No. 195,689
Int. Cl.³ F21B *49/00*
U.S. Cl. 73—152 **22 Claims**



12. Method for combining a plurality of well logging measurements and the like, comprising

electrically generating a first digital indication of the magnitude of a selected lithological parameter of the earth substances traversed by a borehole,

electrically generating a second digital indication of the magnitude of a selected lithological parameter of the earth substances traversed by a borehole,

electrically generating a digital indication of borehole depth with respect to said first digital measurement,

displaying a visual representation of said first, second and third digital indications, and

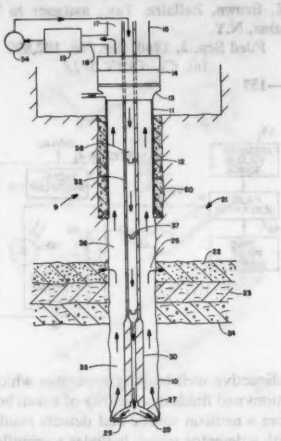
aligning said visual representation of said second digital indication with said first digital indication.

4,346,594
METHOD FOR LOCATING THE DEPTH OF A DRILL STRING WASHOUT OR LOST CIRCULATION ZONE

Allen J. Owings, 710 Saint Ives, Houston, Tex. 77079

Filed Nov. 14, 1980, Ser. No. 206,572
Int. Cl.³ E21B *47/10*
U.S. Cl. 73—155 **6 Claims**

1. In an oil well drilling operation, a method of determining the depth of a drill string washout, said method comprising determining that drilling fluid return volume from the well substantially equals the drilling fluid input volume to the well; determining that a substantial drop in surface circulating pressure has occurred; for given well drilling conditions, determining a first graph of the normal circulating pressures of the drilling fluid versus the depth of points along the flow path within the well; determining for said well drilling conditions a second graph of the actual circulating pressure of the drilling fluid versus the depth of points along the flow path within the well; superimposing one graph over the other graph so as to cause lines representing circulating pressures in the drill string to intersect at the same depth as do the lines representing

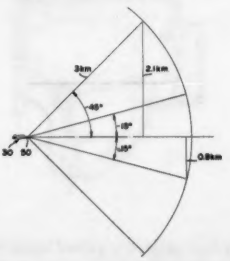


circulating pressures in the annulus, the depth of duel intersection being the depth of the washout.

4,346,595
CAT ALTITUDE AVOIDANCE SYSTEM

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Bruce L. Gary, Pasadena, Calif.

Filed Jan. 12, 1981, Ser. No. 224,231
Int. Cl.³ G01C *21/00*; G01N *1/08*
U.S. Cl. 73—178 R **18 Claims**



1. A method for sensing temperature inversion relative to an aircraft comprising:

directing a microwave radiometer, mounted in the aircraft, into the atmosphere, to receive microwaves at each of a plurality of different angular elevations from the horizontal;

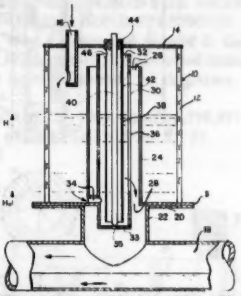
measuring an output of the radiometer at each of said elevations; and

determining elevations at which the output does not substantially decrease with increasing elevation angles.

4,346,596
MILK FLOW MEASUREMENT APPARATUS

Emanuel Diamant; Lev Diamant, and Benjamin Grushko, all of Upper Galilee, Israel, assignors to Mahanaim Diuk Hydraulica, Kibbutz Mahanaim, Israel

Filed Jul. 18, 1980, Ser. No. 170,085
Claims priority, application Israel, Sep. 7, 1979, 58203
Int. Cl.³ G01F *1/22, 15/08*
U.S. Cl. 73—200 **12 Claims**

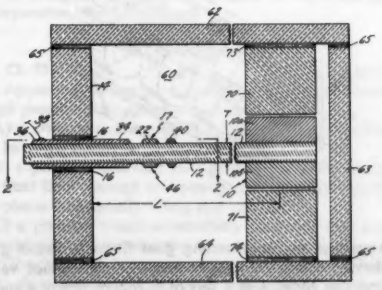


1. Apparatus for milk flow measurement comprising:
debubbling means for receiving milk which may contain bubbles and removing bubbles therefrom;
measuring apparatus receiving milk from said debubbling means and having an outlet the rate of outflow therethrough being a predetermined function of the amount of milk contained therein; and
means for sensing the amount of milk contained in said measuring apparatus, thereby to determine the rate of flow; and
wherein said debubbling apparatus comprises a first container and said measuring apparatus comprises a second container disposed within said first container and connected thereto by a passageway which communicates with the bottom of said first container to permit only debubbled milk to enter said measuring apparatus.

4,346,597
DUAL RANGE, CANTILEVERED MASS ACCELEROMETER

Donald E. Cullen, Manchester, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 3, 1980, Ser. No. 203,822
Int. Cl.³ G01P *15/08*
U.S. Cl. 73—510 **3 Claims**

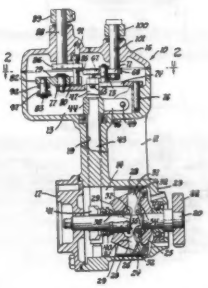


1. A dual range, cantilevered mass accelerometer comprising:
a beam comprised of piezoelectric material rigidly disposed at a proximal end so as to form a cantilever and having an inertial mass disposed at the distal end thereof, a boundary acoustic wave device formed on said beam and oriented for significant frequency sensitivity to strain in said beam, and circuit means for providing a signal indication of the boundary acoustic velocity of a wave in said boundary acoustic wave device,
characterized by:
a pair of stops disposed adjacent said inertial mass and separated therefrom by a distance equivalent to deflections of said beam caused by accelerations of a magnitude defining the desired high end of the low range of said accelerometer, whereby said beam operates as a cantilever within said low range and operates as a beam supported at both ends in said high range.

4,346,598
CAM ACTUATED FUEL MODULATING ENGINE GOVERNOR

Edwin E. Hebb, Dearborn, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 970,456, Dec. 18, 1978, Pat. No. 4,235,212.
This application Jun. 19, 1980, Ser. No. 161,033
Int. Cl.³ G05D *13/14*
U.S. Cl. 73—536 **4 Claims**



1. A rocking flyweight governor mechanism, said mechanism comprising
a support member rotatable about an axis and having a radial support surface extending outwardly from and generally normal to said axis,
at least one flyweight supported on said surface for rotation therewith, said flyweight having a primary weight portion spaced from said axis and said support surface and a finger portion extending inwardly adjacent said axis and having a convexly curved side rockingly engaging said radial support surface to establish an effective line of contact therewith which moves toward or away from said axis in accordance with corresponding rocking motion of the flyweight on the radial support surface,
restraining means acting between radially relatively outward portions of said support member and relatively inward portions of said flyweight to restrain said flyweight against substantial radial sliding motion outward from said axis on said radial support surface and limit said flyweight to essentially rocking motion,
axially movable abutment means adjacent said axis and opposing said finger portion inwardly of its contact line with said radial support surface and
means biasing said abutment means and said finger into engagement adjacent said axis during limited axial movement of said abutment means and accompanying rocking motion of said flyweight,
whereby, upon rotation of said flyweight mechanism at increasing speeds, centrifugal force on said flyweight primary weight portion increasingly tends to rock said

flyweight outwardly, thereby urging said abutment means axially against the force of said biasing means,

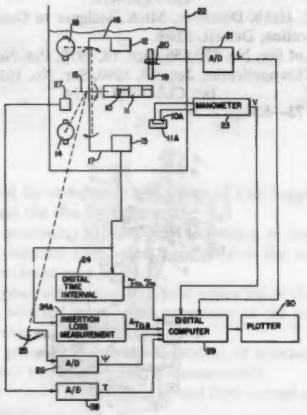
the effect on the abutment means of the exponential increase in centrifugal force with speed and outward rocking of the flyweight being in part offset by a coincidental increase in the lever arm distance from the contact line of the finger with the radial support surface to the engagement point of the finger with the movable abutment.

4,346,599

METHOD AND APPARATUS FOR ULTRASONICALLY TESTING POLYMERS

Albert J. McLaughlin, Lancaster, and Gary W. Paddison, Dover, both of Pa., assignors to Armstrong World Industries, Lancaster, Pa.

Filed Sep. 8, 1980, Ser. No. 184,786
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—597 **25 Claims**



1. A method of ultrasonically testing material comprising:

mounting a specimen of said material in a specimen holder;

immersing said specimen holder in a sound-conducting fluid;

obtaining ultrasonic measurements with a transmitting transducer and receiving transducer supported in opposed orientation on opposite sides of said sample holder;

rotating said transducers about an axis between said transducers;

reorienting said transducers relative to said sample holder;

obtaining new ultrasonic measurements with said transducers;

repeating the steps of obtaining ultrasonic measurements for different temperatures of said fluid;

measuring in situ the temperature dependent characteristics of said specimen at each temperature; and

determining the intrinsic storage moduli and the intrinsic loss moduli of said specimens as a function of temperature from said ultrasonic measurements and from said temperature dependent characteristics.

4,346,600

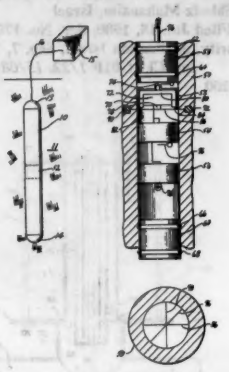
STRESS SENSOR PARTICULARLY SUITABLE FOR ELASTIC, PLASTIC AND VISCO-ELASTIC MATERIALS

Jerome B. Johnson, Goleta, Calif., and Gordon F. N. Cox, Thetford, Vt., assignors to Global Marine Inc., Los Angeles, Calif.

Filed Jul. 28, 1980, Ser. No. 172,678
Int. Cl.³ G01L *1/10*
U.S. Cl. 73—768 **12 Claims**

1. An improved stress sensor for imbedding in a host material comprising:

(a) a rigid, elongated case having an effective Young's modulus relative to the host material to produce a ratio of the Young's modulus of the host material to the effective Young's modulus of the case of less than or equal to 0.25, and at least one end adapted to be imbedded in the host material; and



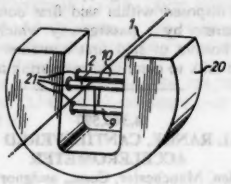
(b) at least one stress sensing transducer secured in the case and directly sensitive to stress induced on the case, the transducer being remote from the end that is adapted to be imbedded such that stress anomalies on such end do not affect the transducer.

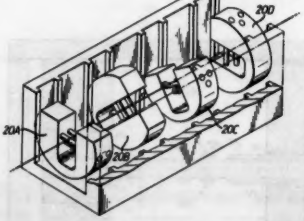
4,346,601

TESTING GLASS FIBRES

Paul W. France, Suffolk, England, assignor to The Post Office, London, England

Filed Aug. 18, 1980, Ser. No. 179,085
Int. Cl.³ G01N *3/08*
U.S. Cl. 73—829 **12 Claims**





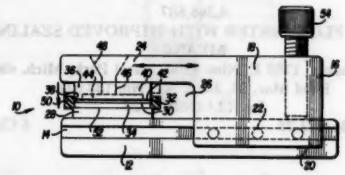
8. Apparatus for proof-testing glass fibres to detect glass fibres having a strength greater than a predetermined value, said apparatus comprising n sets of m rollers, where n and m are greater than 1, each roller being free to rotate, the rollers of each set of rollers being mounted in a respective one of n support means so that the rotational axes of the rollers in each set are parallel, and means for holding said n support means

such that a plane extending perpendicularly through the rotational axes of the rollers of any one set is inclinded to similar planes through the rotational axis of the other sets of rollers, the arrangement being such that when a fibre is drawn through said sets of rollers maximum strain is induced in the fibre at positions substantially evenly distributed about the circumference of said fibre.

4,346,602
APPARATUS AND METHOD FOR MEASURING ADHESIVE BOND STRENGTH

Larry D. Gould, West Canaan, and Donald E. Garfield, Meriden, both of N.H., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 21, 1980, Ser. No. 198,977
Int. Cl.³ G01N *3/24, 33/44*
U.S. Cl. 73—842 **20 Claims**



1. Apparatus for determining the adhesive bond strength of one material to another, comprising:

(a) a rigid base;

(b) a specimen of a first material fixed to said base and provided with a test surface;

(c) first means for providing a layer of a second material bonded to said test surface;

(d) means for selectively providing a fluid-tight seal between said test surface and said first means;

(e) second means for mounting said first means for movement relative to said test surface;

(f) third means for applying a force to cause relative movement between said base and said first means whereby the joint between said layer and said specimen is stressed; and

(g) fourth means for determining the magnitude of said force at which the adhesive bond fails between said first and second materials.

4,346,603
MICROFLOW TRANSDUCER

Carl E. Schmid, Easton, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 6, 1980, Ser. No. 118,960
Int. Cl.³ G01F *1/70*
U.S. Cl. 73—861.05 **12 Claims**

1. Apparatus for precisely measuring low mass flow rates of a high pressure fluid which comprises:

(A) a conduit defining an elongated passage therethrough having a fluid inlet and a fluid outlet;

(B) a piston within said passage propellable therealong by fluid flow through said passage, the cross-section of said piston substantially filling said passage;

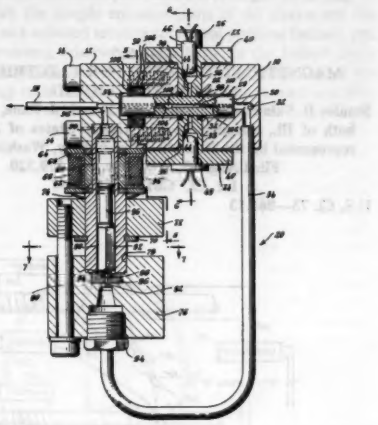
(C) a pressure vessel substantially enclosing said conduit, said pressure vessel defining

(1) a fluid supply passage arranged to channel pressurized fluid about the exterior of said conduit and into said fluid inlet, and

(2) a fluid discharge passage arranged to discharge fluid from said fluid outlet;

(D) sensor means positioned to detect the travel of said piston through a sensing region of said elongated passage in a direction from its fluid inlet to its fluid outlet;

(E) means responsive to said sensor for indicating the flow rate of the fluid in said elongated passage; and

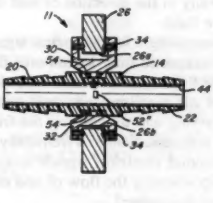


(F) means for reversing the fluid flow direction in said elongated passage to return the piston substantially to its starting point.

4,346,604
ELECTROMAGNETIC FLOW PROBE

Richard K. Snook, Houston; Douglas R. Lester; Pasadena, both of Tex., William C. Childs, deceased, late of Houston, Tex., by Billie W. Childs executrix, assignors to Narco Bio-Systems, Inc., Houston, Tex.

Filed Jul. 14, 1980, Ser. No. 168,295
Int. Cl.³ G01F *1/58*
U.S. Cl. 73—861.12 **26 Claims**



1. Apparatus for measuring fluid flow comprising:

(a) magnetic field production means, including means defining an operative gap, for producing a magnetic field within said operative gap with said magnetic field oriented generally along a first direction;

(b) housing means, including passage means for conducting said fluid flow through said housing means, selectively receivable by, and selectively positionable relative to, said magnetic field production means for conducting said fluid flow through said operative gap along a second direction;

(c) electrode and lead means, within said housing means, for detecting electric potential induced, within said operative gap, across the flow of fluid along a third direction; and

(d) alignment means, including selectively adjustable lug means, for holding, and selectively limiting the positionability of, said housing means relative to said magnetic field production means to effect alignment of said fluid flow within said operative gap along said second line, and to

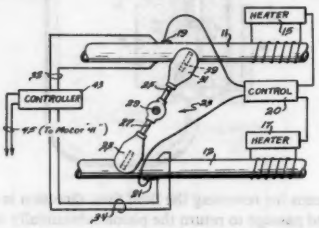
effect orientation of said electrode means for said detecting along said third line, when said housing means is so received by said magnetic field production means.

4,346,605

MAGNETIC FLOWMETER FOR ELECTRICALLY CONDUCTIVE LIQUID

Stanley B. Skladzien, Elmhurst, and Donald J. Raue, Naperville, both of Ill., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Aug. 18, 1980, Ser. No. 179,320
Int. Cl.³ G01F *1/58, 1/64*
U.S. Cl. 73—861.13 **9 Claims**



1. A magnetic flowmeter for an electrically conductive fluid comprising:

a first tube section having walls of non-magnetic material for passing a flow of said electrically conductive fluid;

a second tube section of non-magnetic material parallel to said first tube section but containing a still electrically insulative fluid;

means for producing a revolving magnetic field having at least two diametrically opposed components that synchronously cross the diameters of said first and said second tube sections, said magnetic field moving across said first tube generally in the direction of said flow of electrically conductive fluid;

means for comparing a first electrical signal induced by said revolving magnetic field across said flow of electrically conductive fluid with a second electrical signal induced across said still medium; and

means for varying and monitoring the frequency of of said revolving magnetic field to a frequency at which said first and said second electrical signals attain a predetermined relationship whereby the flow of said electrically conductive fluid is determined.

4,346,606

RATE METER

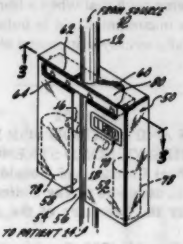
Raymond E. Cannon, San Diego; Jon A. Jenkins, Rancho Santa Fe, and Larry L. Wilson, Poway, all of Calif., assignors to IMED Corporation, San Diego, Calif.

Filed Mar. 10, 1980, Ser. No. 128,662
Int. Cl.³ G01F *13/00*; A61M *5/16*
U.S. Cl. 73—861.41 **24 Claims**

16. In combination for facilitating a visual display by a rate meter of the rate of fall of drops of fluid from a source to a patient,

a drip chamber for guiding the drops of fluid to the patient,

a cross bar fixedly disposed on the drip chamber for coupling to the rate meter, the cross bar being made from a resilient material and being provided with slots at its ends to enhance the resiliency of the cross bar, and



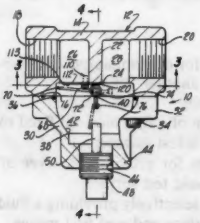
fingers at the ends of the cross bars to function as detents for retaining the rate meter.

4,346,607

FLUID FLOW METER WITH IMPROVED SEALING MEANS

Nils O. Rosaen, 1755 E. Nine Mile, Hazel Park, Mich. 48030

Filed Mar. 24, 1980, Ser. No. 133,622
Int. Cl.³ G01F *1/28*
U.S. Cl. 73—861.75 **6 Claims**



1. A flow indicator device for a fluid system comprising a housing having a chamber, an inlet port and an outlet port registering with said chamber and adapted to be connected with said system; an interior wall extending into said chamber intermediate said inlet port and said outlet port; a vane member rotatably mounted in said housing on an axis disposed closely adjacent the free edge of said interior wall whereby said wall and said vane member cooperate to separate said inlet port from said outlet port; said housing being provided with interior walls having a substantially semi-spherical inner surface, said vane member having a substantially semicircular edge rotatable adjacent said semi-spherical surface, the center of said semi-spherical surface being displaced from the center of the semi-sphere circumscribed by said circular edge upon rotation of said vane member, whereby the space between said edge and said surface varies at each rotative position of said vane member; a shaft having opposite ends rotatably mounted in said housing; means mounting said vane member to said shaft such that said vane member rotates with said shaft about the axis of rotation of said shaft; the improvement comprising a one piece seal member, said seal member being thin walled and constructed of a resilient material, said seal member having a first portion and means for rigidly securing said first portion to said housing so that part of said first portion flatly abuts against said housing, and a second portion of said seal member formed at an end of said first portion and extending between said housing interior wall and said mounting means, said second portion extending substantially entirely along and abutting against the outer peripheral surface of said mounting means to prevent fluid leakage between said vane mounting means and said housing interior wall

and

wherein said seal member is formed so that said second portion of said seal member is resiliently urged against said mounting means when said first portion of said seal member is secured to said housing.

4,346,608

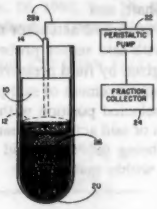
FLOAT DEVICE FOR DENSITY GRADIENT FRACTIONATION

John G. Olenick, Laurel, and Patrick E. Lorenz, Olney, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 31, 1980, Ser. No. 174,069

Int. Cl.³ G01N *1/14*

U.S. Cl. 73—863.21 **2 Claims**



1. In a system for fractional removal and collection of samples of a liquid contained in a tube comprising pump means for pumping out said samples of the liquid from said tube and collector means for separately collecting said samples, the improvement comprising a cylindrical plug device which floats on the surface of the liquid in the tube and which includes a length of sample conveyance tubing extending centrally therethrough in communication with the upper surface of the liquid in the tube, said plug device includes a concavity in the bottom surface thereof which facilitates the removal of air trapped between the bottom of said plug and the surface of the liquid prior to fractionation of said liquid and assures high resolution of sequential samples by minimizing turbulent flow and the consequent mixing of said liquid, and tube means for connecting said sample conveyance tubing to said pump means of the system so as to permit sequential and highly resolved removal of said samples in said tube from the upper surface of said liquid.

4,346,609

FLUID SAMPLING DEVICE

Hans A. Diesel, New Malden, England, assignor to Exxon Research & Engineering Co., Florham Park, N.J.

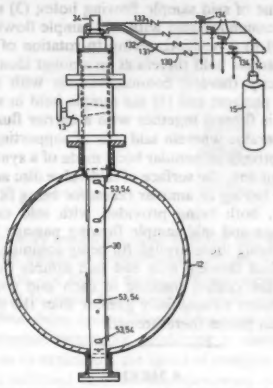
Filed Oct. 24, 1980, Ser. No. 200,387

Claims priority, application United Kingdom, Nov. 6, 1979, 7938332

Int. Cl.³ G01N *1/14*

U.S. Cl. 73—863.33 **20 Claims**

1. A fluid sampling device which, when assembled, comprises: a cylindrical sample receptacle having one end closed and the other end open, a sample entrance port in the cylindrical side of the receptacle, a sample discharge port for the discharge of samples of fluid from the interior of the receptacle; a piston reciprocable in the receptacle; a cam follower associated with the piston so that the follower and the piston move together, the cam follower having a part protruding through a slot in the cylindrical wall of the receptacle; a cylindrical sleeve in which the receptacle is received for relative rotation of the receptacle and sleeve; the sleeve having a sample entrance port which is arranged to be fully in register with the sample entrance port of the receptacle at a selected relative rotational position of the sleeve and the receptacle; the sleeve having an internal cam profile groove in which the protruding part of the cam follower is received and engaged by the sides of the groove to cause reciprocation of the piston in the receptacle during relative rotation of the sleeve and receptacle; a hollow body in which the cylindrical sleeve is received for relative rotation between the sleeve and the body; the body having a sample entrance port which is arranged to be fully in register with the sample entrance ports of the sleeve and the receptacle at a selected relative rotational position thereof; and means preventing relative rotation between the hollow body and the receptacle; the arrangement and construction of the device being such that the said sample entrance ports are fully



in register when the piston is positioned by the engagement of the follower and the cam profile groove substantially at the bottom of its reciprocating stroke relative to the position of the samle discharge port, and such that at least the sample entrance ports of the receptacle and sleeve are fully out of register when the piston is positioned nearer to the sample discharge port than the bottom of its reciprocating stroke, whereby on relative rotation of the sleeve and the receptacle, the movement of the piston towards the top of its stroke causes any contents of the receptacle to be expelled via the sample discharge port.

4,346,610

DEVICE FOR INTRODUCING MICRO AMOUNT OF SAMPLE INTO AN ANALYZING APPARATUS

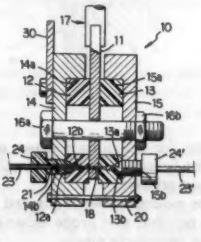
Daido Ishii, Nagoya, and Hideki Konishi, Tokyo, both of Japan, assignors to Japan Spectroscopic Co., Ltd., Tokyo, Japan

Filed Apr. 11, 1980, Ser. No. 139,698

Claims priority, application Japan, Apr. 28, 1979, 54-53126

Int. Cl.³ G01N *1/20*

U.S. Cl. 73—863.73 **11 Claims**



1. A device for introducing micro amount of sample into an analysing apparatus comprising a valve disc of plate form, rotatably disposed about an axle thereof perpendicular to the surface of the valve disc, and a pair of secured supporting members disposed on either side of, for urging from either side

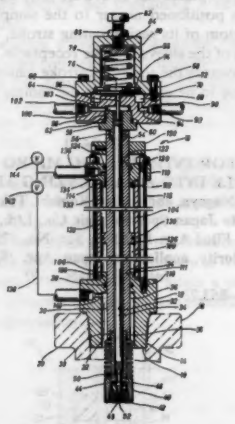
while supporting, said valve disc, and device characterized in that (1) said valve disc is provided with at least one carrier fluid flowing hole and at least one sample flowing hole having a capacity not exceeding 1 μl and having the identical capacity as a sample amount to be introduced, both holes being formed piercing through, and on a same circumferential circle with the center at the rotational axis of, said valve disc; (2) each of said supporting members is provided with at least one carrier fluid flowing passage and at least one sample flowing passage, both being formed piercing through each member at a position to be alignable with at least one of said carrier fluid flowing holes and at least one of said sample flowing holes; (3) said sample flowing hole communicated with said sample flowing passage can be moved to a position, owing to rotation of said valve disc, with a sample held therein at an amount identical to the interior capacity thereof, communicatable with the carrier fluid flowing passage; and (4) the sample held in said sample flowing hole is flowed together with a carrier fluid into said analysing apparatus wherein said pair of supporting members include respectively an annular body made of a synthetic resin for being urged onto the surface of said valve disc and an outer plate member having an annular recess for being fitted by said annular body, both being provided with said carrier fluid flowing passage and said sample flowing passage formed respectively piercing therethrough for being communicated with said carrier fluid flowing hole and said sample flowing hole respectively, the central opening in each said annular body having a diameter substantially greater than the diameter of said axle which passes therethrough.

4,346,611

INSERTION REGULATOR FOR PRESSURIZED PIPELINES

Robert H. Welker, 13839 W. Belfort, Sugar Land, Tex. 77478

Filed Dec. 19, 1980, Ser. No. 218,112
Int. Cl.³ G01N *1/14*
U.S. Cl. 73—863.86 **13 Claims**



1. An apparatus for mounting a sensor means for insertion into and retraction from a pressurized vessel such as a pipeline, said apparatus comprising:

a. sensor probe mounting means adapted for sealed connection to said pipeline, said probe mounting means defining sensor probe receptacle means;

b. an elongated sensor probe shaft of tubular from defining an elongated passage, said probe shaft extending in relatively movable sealed relation through said sensor probe mounting means and defining inner and outer extremities, said sensor probe shaft being movable to an operative position where said inner extremity is positioned within said pipeline and movable to a retracted position where said inner extremity is retracted from said pipeline and positioned within said sensor probe receptacle means; and

c. an inlet valve being provided at the inner extremity of said sensor probe shaft;

d. a valve actuator shaft being movably disposed within said elongated passage and having operative connection with said inlet valve;

e. a diaphragm assembly being connected to the outer extremity of said sensor probe shaft and having actuating connection with one extremity of said valve actuator shaft;

f. means controlling actuation of said diaphragm assembly for inducing inlet valve opening movement to said diaphragm assembly and valve actuator shaft;

g. a sensor probe being located at said inner extremity of said sensor probe shaft; and

h. fluid pressure energized actuactor means being controllably coupled with said sensor probe shaft and being controllably energized by fluid pressure from said pipeline to ensure insertion movement of said probe from said receptacle to a preselected position within said pipeline, upon deenergization of said actuator means said probe shaft and sensor probe being moved to said retracted position by fluid pressure within said pipeline.

4,346,612

LIQUID SAMPLER

John H. Rand, Cornish, N.H., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 30, 1981, Ser. No. 248,934
Int. Cl.³ G01N *1/08, 1/12*
U.S. Cl. 73—864.44 **3 Claims**

1. A sampler comprising:

a hollow cylindrical sampling tube having a top and a bottom; valve means affixed at the bottom of said sampling tube;

a cylindrical cutting shoe having a top and a bottom;

the top of said cutting shoe being affixed to said valve means;

the bottom of said cutting shoe being sharpened;

adapter means for connecting an extension to the top of said sampling tube;

said adapter means being effective to permit substantially free flow of fluid axially therethrough;

said valve means including a cylindrical membrane having a first condition wherein it conforms to a substantially cylindrical shape permitting substantially free fluid communication therethrough and having a second condition

wherein it assumes a closed hourglass shape permitting substantially no fluid communication therethrough;

said valve means further including a body having a string guide therethrough, a string affixed at a first end to said body, a loop in said string encircling said cylindrical membrane and said string passing through said string guide; and

said loop, when tightened by pulling said string, producing said second condition.

4,346,613

LIQUID SAMPLE COLLECTOR DEVICE

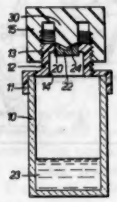
Robert C. Turner, May Cottage, Great Milton, Oxfordshire, OX9 7NT, and Rury R. Holman, 42 Meadow Close, Farmoor, Oxfordshire, OX2 9NZ, both of England

Filed Nov. 18, 1980, Ser. No. 208,025

Claims priority, application United Kingdom, Nov. 19, 1979, 7939887

Int. Cl.³ G01N *1/12*

U.S. Cl. 73—864.51 **9 Claims**



1. A collector device for receiving, metering and holding a sample of liquid of predetermined small volume, which comprises a collection vessel having an aperture leading into its interior, a plug which is a push-fit in the aperture and closes the vessel when inserted in the aperture prior to use of the device, the plug being capable of being pushed slidably through the aperture to enter the interior of the vessel, and a co-operating spigot member capable of being inserted into the aperture as a close fit therein, the opposed ends of the plug and spigot member being formed with co-operating formations shaped to define between them, when the said ends of the spigot and plug are abutted, a space of predetermined volume by which in use a sample of the liquid can be metered and temporarily trapped therein, whereby in use the spigot member can be advanced inwardly through the aperture in abutment with the plug to push the plug ahead of it and displace the plug from the aperture into the interior of the vessel so as to transfer the trapped metered liquid sample into the interior of the vessel, the spigot member when so advanced fitting closely within the aperture so as to close the vessel.

4,346,614

PROCESS AND DEVICE FOR INSTALLING A VERTICAL GYROSCOPE

Joseph Jouaillec, Versailles, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Aug. 21, 1980, Ser. No. 179,994

Claims priority, application France, Sep. 3, 1979, 79 22006

Int. Cl.³ G01C *19/26, 19/30*

U.S. Cl. 74—5.12 **2 Claims**

1. A gyroscopic device adapted to be mounted on a moving craft comprising:

a mass of revolution rotatable about an axis of rotation serving as a vertical reference;

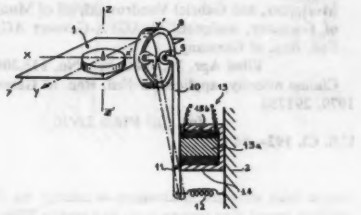
means for suspending said mass allowing said axis of rotation to be suspended with respect to the pitch axis and the roll axis of said moving craft;

drive means for driving said mass in rotation about its axis;

roll reset means for resetting said axis of rotation into roll when said mass does not rotate;

a mechanical errector system having a driven rotary pendulum, tending automatically to reset said axis of rotation of said mass on the vertical;

said drive means, said return means, and said erector system being controlled electrically in parallel from a common source of supply;



first time delay means disposed between said source and said roll reset means for producing a first delay such that, on its expiration, the kinetic moment of said mass in rotation is sufficient to insure the stability thereof; and

second time delay means disposed between said source and said erector system for producing a second delay such that, on its expiration, the speed of rotation of said pendulum is sufficient to avoid any movement of precession of the device about its roll axis.

4,346,615

STARTING DEVICE FOR AN ENGINE

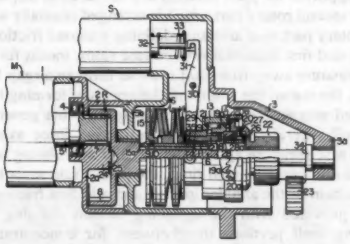
Tadao Yoneda, and Michinori Tsunoda, both of Fukaya, Japan, assignors to Sawafuji Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1980, Ser. No. 135,854

Claims priority, application Japan, Dec. 24, 1979, 54-167801

Int. Cl.³ F02N *15/06;* F16D *43/06*

U.S. Cl. 74—7 A **10 Claims**



1. In a starting device for an engine in which a drive shaft coupled with a starting motor is connected to a pinion gear through a one-way clutch having a pair of drive and driven clutch members for driving a ring gear of the engine, the improvement comprising a first sleeve slidably fitted over said drive shaft through a first helical spline, said first spline acting to impart to said first sleeve a thrust in a direction toward said ring gear upon rotation of said drive shaft, a second sleeve slidably fitted over said first sleeve through a second helical spline, said second spline acting to impart to said first sleeve a further thrust in a direction toward said ring gear upon rotation of said first sleeve, said drive clutch member of said one-way clutch slidably fitted over said second sleeve through a third helical spline having a helical angle in the same direction as the first helical spline, and a buffer spring interposed between said first sleeve and said one-way clutch so as to be

deformable for absorbing an excessive load transmitted from said ring gear to said one-way clutch.

4,346,616

ELECTROMAGNETICALLY OPERATED FRICTION DISK-FREE CLUTCH

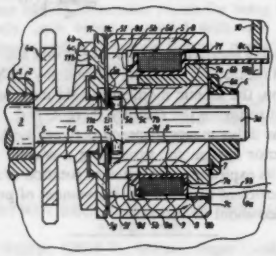
Wolfgang Geisslinger; Karel Pustka; Hermann Brönner; Ludwig Müllritter, and Gabriel Vondrowski, all of Munich, Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Apr. 24, 1980, Ser. No. 143,304

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1979, 291754

Int. Cl.³ F16D 27/10

U.S. Cl. 192—84 C 8 Claims



1. An electromagnetically operated disk-free clutch for coupling two rotary parts, comprising a stator in the form of a hollow cylinder of a magnetizable material, an electromagnetic coil mounted on the outer surface of said stator, a rotor connected to one rotary part and defining at one face thereof a first frictional ring and at the other face thereof an annular groove for accommodating said cylindrical stator, a magnetic armature supported for joint rotation and for an axial displacement on the second rotary part which is arranged coaxially with said first rotary part, said armature defining a second frictional ring facing said first frictional ring on said rotor, means for biasing said armature away from said rotor to form an airgap therebetween, the stator, the rotor and the armature forming together a closed magnetic circuit for the magnetic flux generated by said coil whereby the resulting attractive force axially displaces said armature against the force of said biasing means to engage said two frictional rings, the part of said rotor between said bottom of the annular groove and said first frictional ring being provided with throughgoing cutouts defining narrow bridging wall portions therebetween for concentrating the magnetic flux before entering said armature, and the outwardly directed face of said cylindrical stator being provided with a radial flange covering said annular groove and providing a uniform path for said magnetic flux, said flange having an opening, said electromagnetic coil being wound on a support body of a plastic material, the outer surface of said stator snugly fitting into said support body, said support body being made by a diecasting process and including an outwardly projecting locking pin passing through the opening in said radial flange of said stator body and engaging a corresponding recess in the same for supporting said rotor; said coil supporting body including an inwardly directed annular projection for spacing said stator from the bottom of said annular groove in said rotor, and said rotor and said stator being secured against axial displacement by a clamping ring mounted on the first rotary part and abutting against the outer end faces of said rotor and said stator.

4,346,617

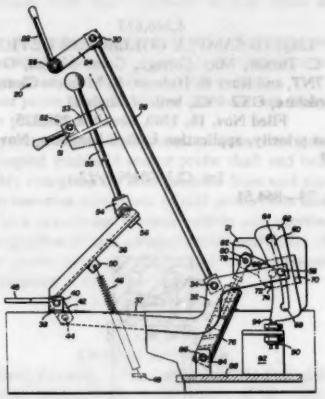
GROUND DRIVE CONTROL

Philip W. Schroeder, Derby, and Edgar K. Lindstrom, Wichita, both of Kans., assignors to J. I. Case Company

Filed Jun. 27, 1980, Ser. No. 163,553

Int. Cl.³ G05G 11/00, 1/14

U.S. Cl. 74—481 4 Claims



1. A ground drive control mechanism for a machine having a hydrostatic transmission, a transmission control means rotatable about one axis into forward, reverse, and neutral operating positions to control the input to said hydrostatic transmission, said ground drive control mechanism comprising:

shift means including a shift lever, said shift lever connected at one of its ends to actuating linkage and movable means connected to the other end of said shift lever, said shift lever being shiftable by said movable means from a neutral position into forward or reverse;

depressible foot pedal means for controlling the speed of the machine movement in a selected direction, said foot pedal means including a pivotal foot pedal and means for biasing said foot pedal in one direction, said actuating linkage interconnecting said shift lever and said foot pedal means;

rotatable selector means mounted to said transmission control means, said rotatable selector means including a selector plate having a slot with detent positions for forward, neutral and reverse directional control, pin means for slidably mounting one end of said actuating linkage within said selector plate slot and said pin means being selectively movable into one of said detent positions in response to movement of said shift lever thereby setting said transmission to propel the machine in a selected direction, said biasing means applying a constant tension on said actuating linkage for holding said pin means locked in the selected detent position;

manual override means including a heel tab actuator connected to said foot pedal, depression of said heel tab actuator moving said actuating linkage for rotating said transmission control means towards its neutral position without affecting the directional position setting at said selector plate; and

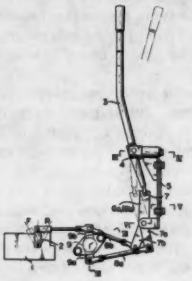
automatic override means connected to said transmission control means, said automatic override means rotating said transmission control means towards its neutral position in response to the release of said foot pedal without affecting the directional position setting at said selector plate.

4,346,618

SPEED CONTROL APPARATUS FOR A VEHICLE

Masaaki Sakamoto, Kaga, and Shinji Takeuchi, Komatsu, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 21, 1980, Ser. No. 151,979
Claims priority, application Japan, May 22, 1979, 54-62138
Int. Cl.³ G05G 7/00, 5/16
U.S. Cl. 74—491 1 Claim



1. A speed control apparatus for a vehicle, comprising:
a frame of the vehicle;
a speed control lever having a ball connector formed thereon at a lower end thereof pivotally mounted in every direction at an intermediate portion thereof to said frame;
a console mounted on said frame, said console having formed therein a U-shaped guide groove in which said speed control lever is adapted to move;
a pair of substantially straight levers each pivotally mounted at an intermediate portion thereof to said frame, each of said pair of levers having a notch formed threin at an upper end thereof whereby the ball connector is selectively engageable with either one of the notches as said speed control lever is moved in the guide groove of said console, the selected lever being pivoted thereby;
a pair of rod means each pivotally connected at one end thereof to the other ends of said respective levers;
a turning member rotatably mounted to said frame, said turning member having a pair of arms projecting therefrom in opposite directions from each other relative to the axis of said turning member, each arm being pivotally connected to the other ends of said respective rod means;
spring means for applying a braking force to said turning member against rotation; and
control valve means for forward and reverse change-over and speed control of the vehicle, said control valve means being connected to one of said arms and adapted to be changed over between forward and reverse positions in accordance with the turning direction of said turning member.

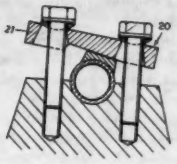
4,346,619

ADJUSTABLY CLAMPABLE MOTORCYCLE HANDLEBAR

Ernst Fehling, Werler Strasse 1, D-5757 Wickede-Wimbern, Fed. Rep. of Germany

Filed May 23, 1980, Ser. No. 152,581
Claims priority, application Fed. Rep. of Germany, May 25, 1979, 7915066[U]
Int. Cl.³ B62K 21/18
U.S. Cl. 74—551.1 5 Claims

1. In a mounting assembly for a motocycle having a front frame supporting a front wheel of the motocycle and a tube-shaped handlebar supported on said front frame and having a central portion and two lateral bent portions outwardly extended from the central portion, and clamping means for supporting the handlebar on said front frame, the combination comprising at least two clamping devices each including a lower clamping plate having a bearing surface to receive the respective part of said central portion, said central portion adapted to pivot in said bearing surface due to various inclined positions of the handlebar; an upper clamping plate having an upper surface and a lower surface and being formed with a pair of bores; and a pair of headed screws extending through said bores into said lower clamping plate, said central portion being



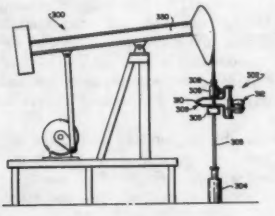
provided with an extension projecting towards said upper clamping plate and adapted to abut against said lower surface thereof, said bores widening in a direction towards said lower clamping plate to loosely receive said screws, each of said pair of screws extending into said lower clamping plate at a different distance so that said upper clamping plate is inclined due to desired inclined position of the handlebar whereby functioning of the handlebar will be maintained even in the event of loosening of said headed screws.

4,346,620

SHOCK ABSORBING MEANS FOR A ROCKER ARM TYPE OIL WELL PUMP

George E. Stanton, Orient, Ohio, assignor to Nujack Oil Pump Company, Columbus, Ohio

Filed Jun. 5, 1980, Ser. No. 156,780
Int. Cl.³ F16H 21/32
U.S. Cl. 74—583 6 Claims



1. A shock absorbing means for attachment to a rocker arm type well pumping apparatus, said shock absorbing means being attached to a sucker rod pumping string between a cable retention bracket and a sucker rod rotator;
the attachment including upper and lower jaws hinged at one side and having a coxial piston and cylinder combination mounted between the jaws at the other side;
hydraulic fluid in the cylinder in contact with the piston and in fluid communication with a fluid-tight reservoir partially filled with hydraulic fluid.

4,346,621

POWER TRANSMISSION APPARATUS

William T. Griffin, Indian Trail, N.C., assignor to Automated Energy Systems, Inc., Matthews, N.C.

Filed Sep. 7, 1978, Ser. No. 940,177
Int. Cl.³ F16H 37/06; D06H 3/12
U.S. Cl. 74—665 G 4 Claims

1. A power transmission apparatus for variably controlling the speed of two rotatable outputs by oppositely varying the

rotational speed of each output in direct proportion to each other, and whereby the cummulative rotational speed of the two outputs remains constant for a given input speed, said apparatus comprising

a box-like enclosed housing defining opposed side walls,

a first shaft rotatably mounted to extend at least substantially between said side walls,

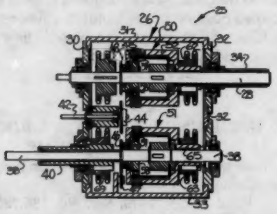
a second shaft rotatably mounted to extend at least substantially between said side walls and through one of said side walls, and being disposed parallel to and laterally spaced from said first shaft,

first and second differential drive units, said first unit being coaxially disposed about said first shaft and said second unit being coaxially disposed about said second shaft, each of said drive units comprising

(a) a circular spline having internal gear teeth,

(b) a flexible spline coaxially disposed within said circular spline and having external gear teeth, and

(c) a wave generator coaxially disposed within said flexible spline and operatively deflecting said flexible spline so that the teeth thereof operatively engage the teeth of said circular spline in at least two angularly spaced locations interspaced by locations at which the teeth are not interengaged,



power input means comprising a first sleeve rotatably mourted about said first shaft and extending through one of said housing side walls and being fixed to said circular spline of said first drive unit, a second sleeve rotatably mounted about said second shaft and being fixed to said circular spline of said second drive unit, and means interconnecting said first and second sleeves for concurrent rotation,

power output means for said first drive unit comprising means interconnecting said flexible spline of said first drive unit with said first shaft, a third sleeve rotatably mounted about said second shaft and extending through one of said housing side walls, and means interconnecting sai

power output means for said second drive unit comprising means interconnecting said flexible spline of said second drive unit with said second shaft, and

correction input means comprising a third shaft mounted to extend through one of said housing side walls, and means for interconnecting said third shaft to said wave generator of each of said drive units, and such that the wave generators uniformly rotate in opposite directions in response to rotation of said third shaft.

4,346,622

FOUR SPEED TRANSAXLE WITH MID-POSITION TRANSFER DRIVE

Stanley L. Pierce, Walled Lake, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 9, 1980, Ser. No. 148,431

Int. Cl.³ F16H *47/08, 37/08, 37/00*

U.S. Cl. 74—688 **7 Claims**

1. A four speed automatic overdrive transaxle for an engine powered vehicle comprising:

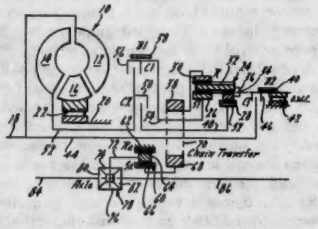
a hydrokinetic unit having a bladed impeller connected to said engine and a bladed turbine;

a compound planetary gear unit comprising a large sun gear, a small sun gear, a set of long planet pinions engaging said large sun gear, a set of short planet pinions engaging said small sun gear, said pinions being mounted on a carrier and engaging each other, and a ring gear engaging the long planet pinions;

said planetary gear unit, said hydrokinetic unit and said engine being arranged on a first axis, a differential gear mechanism having torque output side gears adapted to be connected to paired axle shafts mounted for rotation about a second axis spaced laterally with respect to said first axis;

a torque transfer drive mechanism disposed between said planetary gear unit and said hydrokinetic unit having a torque input element connected to said ring gear and a torque output element connected to the torque input side of said differential gear mechanism;

first clutch means for connecting said turbine to said large sun gear during reverse drive, second clutch means for connecting said turbine to said small sun gear during operation in the first three forward drive ratios and third clutch means for connecting said impeller to said carrier during operation in overdrive, said first clutch means and said second clutch means each having friction discs located between said engine and said torque transfer drive mechanism, said first clutch means and said second clutch means each having an annular cylinder rotatably mounted



for rotation about a common axis, said annular cylinders being in radially spaced dispersion, one with respect to the other;

first brake means for braking the large sun gear during operation in the second underdrive ratio and during operation in overdrive and second brake means for braking said carrier during operation in the first underdrive ratio and during operation in overdrive;

said first and second clutch means having a common turbine torque input element, said torque input element having an externally splined portion for carrying internally splined clutch discs of said first clutch means and an internally splined portion for carrying externally splined clutch discs of said second clutch means, said torque input element also defining an annular cylinder for said second clutch means;

an annular piston in said cylinder engageable with the clutch discs of said second clutch means, the discs of said first clutch being located radially outward from the clutch discs of said second clutch means, a torque output element of said first clutch means extending radially between said second clutch means and the torque input element of said transfer drive mechanism;

said second brake means being situated on the side of said planetary gear unit remote from said transfer drive mechanism in radially spaced relationship, one with respect to the other;

said differential gear mechanism being located approximately in the transverse operating plane of said hydroki-

netic unit, the latter being disposed between said engine and said first and second clutch means;

said torque transfer drive mechanism comprising a final drive ring gear connected to a stationary housing portion for said transaxle;

a final drive sun gear connected drivably to said ring gear;

said torque output element of said torque transfer drive mechanism being a planetary carrier; and

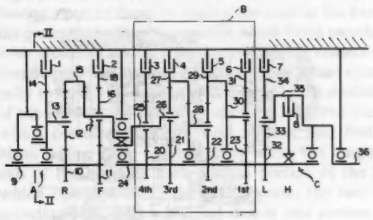
final drive pinions on said final drive carrier engaging said final drive sun gear and said final drive ring gear.

4,346,623

VARIABLE SPEED PLANETARY TRANSMISSION

Masahiro Tatsuo, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Feb. 28, 1980, Ser. No. 125,58›
Claims priority, application Japan, Feb. 28, 1979, 54-24208[U]
Int. Cl.³ F16H *57/10, 37/00*
U.S. Cl. 74—764 3 Claims



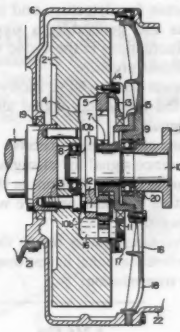
1. A variable speed transmission including a transfer section for establishing operating direction, a variable speed planetary transmission section arranged in operating alignment with said transfer section, and a range section for effectively multiplying the number of speed ratios established by said variable speed planetary transmission section, said transfer section comprising a power input shaft, a planetary gear train for forward operation having a sun gear, a planet gear set, a carrier, a ring gear and brake means for selectively stopping the ring gear, and a planetary gear train for reverse operation having a sun gear, a planet gear set, a carrier and brake means for selectively stopping the carrier, the sun gears of both said planetary gear trains being coupled with said power input shaft; said variable speed planetary transmission section comprising a center shaft aligned with said power input shaft, and first, second, third and fourth planetary gear trains coupled in succession, each having a sun gear, a planet gear set, a carrier, a ring gear and brake means for selectively stopping the ring gear, the carrier of one of said planetary gear trains for forward operation of the transfer section being operatively coupled with the carrier of said fourth planetary gear train; and said range section comprising a power output shaft aligned with said center shaft, a planetary gear train having a sun gear, a planet gear set, a carrier, a ring gear, and brake means for selectively stopping the ring gear, the carrier of said planetary gear train being operatively coupled with said power output shaft, and clutch means for selectively directly coupling said center shaft with said power output shaft wherein the carrier of said first planetary gear train is coupled with the ring gear of said second planetary gear train, the carrier of said second planetary gear train is coupled with the ring gear of said third planetary gear train, and the carrier of said third planetary gear train is integrally formed with the carrier of said fourth planetary gear train.

4,346,624

PLANETARY SPEED CHANGE GEARING

Michisuke Nagasaki, Toyonaka, and Shigehiro Sannomiya, Minoo, both of Japan, assignors to Yanmar Diesel Engine Co., Ltd., Osaka, Japan

Filed Nov. 13, 1979, Ser. No. 93,811
Claims priority, application Japan, Nov. 13, 1978, 53-155831[U]; Nov. 13, 1978, 53-155832[U]
Int. Cl.³ F16H *3/44, 57/10*; G05G *1/00, 3/00*
U.S. Cl. 74—784 11 Claims



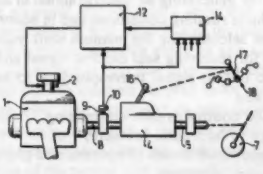
1. A power transmission system comprising an input driver shaft and an output driven shaft, a flywheel affixed to said driver shaft for rotation with said driver shaft and including a recessed portion, a flywheel housing enclosing said flywheel and planetary speed change gear means for enabling the driven shaft to be rotated at a speed different from that of the driver shaft, said gear means comprising at least three gear types respectively supported by the flywheel, the flywheel housing and the driven shaft, said gear means being substantially disposed in the recessed portion of said flywheel so as to be substantially recessed in said flywheel, said transmission system further including a cover member concentric with said driven shaft and said sun gear, secured to said flywheel for rotation therewith and for covering the flywheel recess whereby said planetary speed change gear means are substantially enclosed in the flywheel recess.

4,346,625

APPARATUS FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE

Reinhard Latsch, Vaihingen, and Valerio Bianchi, Hochdorf, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 114,765, Jan. 23, 1980, abandoned, which is a continuation of Ser. No. 824,190, Aug. 12, 1977, abandoned. This application Dec. 4, 1980, Ser. No. 212,769
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1976, 2642738
Int. Cl.³ B60K *41/06, 41/10*
U.S. Cl. 74—859 2 Claims



1. An apparatus for controlling the operation of an internal

combustion engine installed in a vehicle to provide motive power thereto comprising:

fuel-air mixture preparation means for an internal combustion engine having a combustion chamber;

a transmission means to provide transmission of rotary power at variable speed ratios from said engine to said vehicle;

an indicator means connected to the transmission for generating a signal indicating a speed ratio of the transmission;

a crankshaft rotatable by said transmission means;

a marker on said rotatable crankshaft;

transducer means for detecting said marker as said crankshaft rotates and generating a signal indicating engine speed and fluctuations in the cyclic variations of the combustion chamber pressure;

a reference means connected to receive the indicator means signal and the transducer signal and which generates a reference signal;

a control means connected to receive the transducer signal and the reference signal for changing the fuel-air mixture after comparing the fluctuations in the cyclic variations of the combustion chamber pressure with the reference signal; and wherein

the indicator means signal is fed to the reference means to adjust the reference signal in response to a change in speed ratio of the transmission.

4,346,626

CONTROL DEVICE FOR AUTOMATIC TRANSMISSION

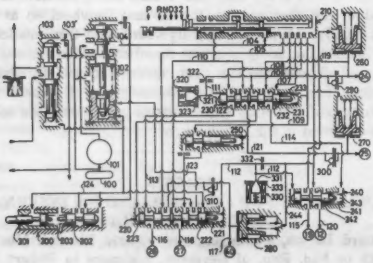
Mutsumi Kawamoto, Nagoya, Japan, assignor to Aisin-Warner K.K., Anjo Aichi, Japan

Filed Dec. 21, 1979, Ser. No. 106,376

Claims priority, application Japan, Dec. 27, 1978, 53-164836; Apr. 11, 1979, 54-43773

Int. Cl.³ B60K *41/06, 41/10*

U.S. Cl. 74—866 **7 Claims**



1. A control device for an automatic transmission having a gear system provided with a plurality of friction engaging elements for providing torque corresponding to a plurality of gear ratios including an overdrive ratio to a transmission output shaft, comprising:

a manual shift valve for manually selecting neutral, forward and reverse drive positions;

an electric control circuit comprising signal generating means for generating an electric signal in accordance with the vehicle running conditions and in accordance with the position selected for the manual shift valve, and a logic circuit for receiving said electric signal and generating an electric output signal corresponding to one of the gear ratios; and

a hydraulic control system comprising

a source of hydraulic pressure,

hydraulic servo means to operate said plurality of friction engaging elements,

a shift valve operable between first and second positions for receiving hydraulic pressure from said hydraulic pressure source and supplying hydraulic pressure to said hydraulic servo means through fluid passages, and

a solenoid valve to control the position of said shift valve in response to the electric output signal of said electric control circuit,

whereby said friction engaging elements associated with the overdrive ratio are engaged to provide torque to the transmission output shaft for a predetermined period of time when said manual shift lever is manually shifted from neutral to the forward or reverse drive position.

4,346,627

SHIFT CONTROL DEVICE FOR AN AUTOMATIC TRANSMISSION

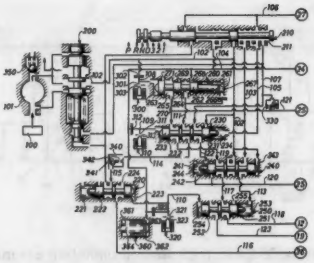
Mutsumi Kawamoto, and Nobuaki Miki, both of Nagoya, Japan, assignors to Aisin-Warner K.K., Anjo, Japan

Filed Oct. 19, 1979, Ser. No. 86,358

Claims priority, application Japan, Oct. 28, 1978, 53/132962

Int. Cl.³ B60K *41/06*

U.S. Cl. 74—869 **10 Claims**



1. A shift control device for a vehicle with an automatic transmission having a gear system provided with a plurality of friction engaging means for selecting a plurality of gear ratios according to vehicle running conditions, comprising:

an electric control circuit comprising signal generating means for generating an electric signal in accordance with the vehicle running conditions and a logic circuit for receiving said electric signal and generating an electric output signal corresponding to one of the gear ratios; and

a hydraulic pressure control system comprising hydraulic servo means to operate said plurality of friction engaging means,

a source of line pressure,

a shift valve operable between first and second positions, said shift valve supplying hydraulic operating pressure to said hydraulic servo means through a fluid passage,

a solenoid valve to control the position of said shift valve in response to the electric output signal of said electric control circuit,

a pressure hold valve connected to said fluid passage between said shift valve and said hydraulic servo means, said pressure hold valve responsive to hydraulic line pressure and to hydraulic operating pressure supplied by said shift valve, and

a flow control valve in fluid communication with said pressure hold valve, said flow control valve restricting discharge of hydraulic operating pressure from said pressure hold valve

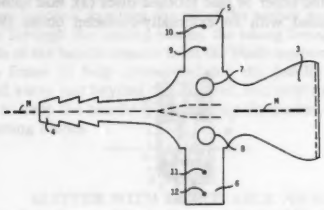
whereby discharge of hydraulic operating pressure from said hydraulic servo means is restrained and said friction engaging means remains engaged for an appointed time.

4,346,628

METHOD FOR MAKING A HEAD OF PIOLET

Jean-Claude Bibollet, F-Glapigny-74230-Thones, France

Filed Dec. 11, 1979, Ser. No. 102,425
Claims priority, application France, Dec. 12, 1978, 78 36054
Int. Cl.³ B25D 7/00
U.S. Cl. 76—109 3 Claims



1. A method of making the head of a piolet or the like comprising:

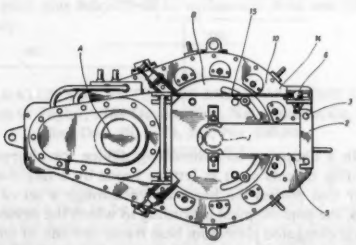
producing the head, all in one piece, by punching out a metallic blank from a plate of metal to form a head including a pike sectiion, a peen section and a mounting section having a pair of flaps for joining the head to the handle of the piolet or the like, the metallic blank being punched out with a outline which is symmetrical with respect to the longitudinal axis thereof, and then being folded symmetrically to form a crease line with respect to the medial plane of the blank along that portion of the length of the blank which corresponds to the pike section, said folding of blank taking place approximately along the longitudinal axis of the metallic blank for the portion of the length which corresponds to the pike section, the two corresponding parts which are provided in that portion of the length corresponding to the pike section being positioned closely adjacent to one another and being joined together to form the pike of the piolet or the like, the mounting section being folded at least once to form a crease line with the two flaps each extending downwardly from the crease line or lines and the peen part being essentially unfolded, viewed in a plane perpendicular to the longitudinal axis.

4,346,629

TONG ASSEMBLY

Robert B. Kinzbach, Houston, Tex., assignor to Weatherford-/Lamb, Inc., Houston, Tex.

Filed May 2, 1980, Ser. No. 145,905
Int. Cl.³ B25B 17/00
U.S. Cl. 81—57.2 8 Claims



1. In a tong having at least one jaw, each jaw pivotably connected to a link which link is pivotably connected to a rotary element and a drag plate connected to the rotary element for actuating the jaws, and brake means for engaging the drage plate, the improvement in brake means comprising,

brake means engageable with the drag plate for causing toggle action for placing the jaws in a gripping relationship with a joint, and

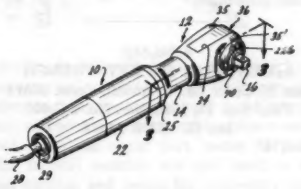
releasing means connected to the brake means for releasing the brake means when the jaws are in a seated gripping position.

4,346,630

RATCHET WRENCH

Anthony Hanson, Huntington Beach, Calif., assignor to Rodac Pneumatic Tools, Carson, Calif.

Filed Dec. 17, 1979, Ser. No. 104,538
Int. Cl.³ B25B 17/00
U.S. Cl. 81—57.13 2 Claims



1. In a ratchet wrench assembly having a head and a handle part and motor drive means, the head being bifurcated forming a yoke, having legs, the side parts of the head each having a circular bore therein, an angularly oscillating member positioned between the legs of the yoke the oscillatable member having a toothed bore, and means for oscillating the said member, the improvements comprising a rotor member mentioned within the head, the rotor member carrying a ratchet pawl positioned to be engagable with the teeth in the bore of the oscillating member, shaft means driven by the rotor member, means for holding the rotor member in position in the head, and a friction member mounted between a part of the said rotor and the holding means, the holding means including at least one bushing having a part fitting in one of said bores, the bushing having a radial flange part, the said rotor part having a portion of larger diameter and a portion of smaller diameter with an annular shoulder between said portions, the friction member being a flat wave washer lying between said flange and a radial surface of the rotor member formed by said portion of smaller diameter, adjacent to said annular shoulder.

4,346,631

WELL PIPE SPINNING AND TORQUEING APPARATUS

George I. Boyadjieff, Anaheim, Calif., assignor to Varco International, Inc., Orange, Calif.

Filed Sep. 16, 1980, Ser. No. 187,702
Int. Cl.³ B25B 13/50
U.S. Cl. 81—57.34 14 Claims

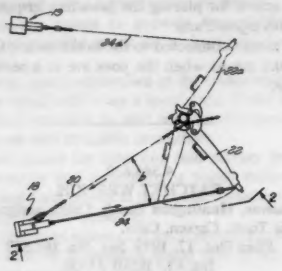
1. Well pipe spinning and torqueing apparatus comprising:

a power unit including a first section and including a second section which is power actuable along an axis relative to the first section and moves in opposite directions along said axis;

a first elongated flexible element adapted to be connected to a pipe gripping tong and connected to said movable second section of said power unit in a relation exerting a pulling force on said element and the tong upon movement of said second section of the power unit in one of said direction; and

a second elongated flexible element adapted to be wrapped about and spin a well pipe and connected to said movable

second section of the power unit in a relation exerting a pulling force on said second element to spin the pipe upon



movement of said second section of the power unit in the other of said directions.

4,346,632

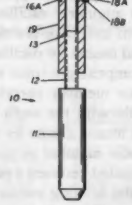
ADJUSTABLE SOCKET WRENCH

Julius Kovacs, 32 Cedar La., Trumbull, Conn. 06611

Filed Sep. 15, 1980, Ser. No. 187,409

Int. Cl.³ B25B *13/16*

U.S. Cl. 81—174 6 Claims



1. An adjustable socket wrench comprising a handle means and a connected shank, a pair of socket jaws, means for fixably connecting one of said jaws to said shank and means for movably mounting the other jaw on said shank, and means for adjusting said movable jaw relative to said fixed jaw, and including a means disposed between said jaws to resist a turning moment when a torque force is applied to said wrench, wherein said last mentioned means comprises a wedge disposed between said jaws, and means for rendering said wedge slightably adjustable relative to said jaws as said jaws are moved to an adjusted position.

4,346,633

SPARK PLUG WRENCH ADAPTED FOR ADJUSTABLE TORQUE

Rene Rendl, Lukas-Cranach-Str. 4, D-6710 Frankenthal, Fed. Rep. of Germany

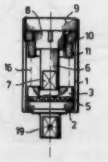
Filed Oct. 20, 1980, Ser. No. 198,720

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1979, 2944182

Int. Cl.³ B25B *23/14*

U.S. Cl. 81—475 5 Claims

1. A spark plug wrench comprising a cylindrical housing, two toothed discs disposed in said housing, spring means urging said discs against one another, said discs having sets of teeth at their confronting faces and each of said teeth having at one side a sharply depending flank and, at the other side, a shallow depending flank, a first connection means on one of said discs for engagement with an operating tool, and a second connection means on the other of said discs for operation by means to vary torque applied by said wrench, characterized by: a connection spindle (6) carried at one end of said housing and holding one of said toothed discs (3) against rotation but adapted for axial displacement relatively to the latter, said housing being equipped with an inturned collar (4) for abutment with the other of said toothed discs (2), said spindle (6) being provided with an externally-threaded collar (9) supported against the internal wall of said housing (1), a loose externally-threaded ring (10) associated with said threaded collar (9) and the latter being equipped with setscrews (12,13) for coupling and fixing said loose ring (10) to said collar (9), a torque-adjusting ring (11) disposed on a boss (8) of said spindle, said boss having external threading of opposite hand to internal threading on said loose ring (10), and a pack of spring washers between said torque-adjusting ring (11) and the inner of said toothed discs (3).



4,346,634

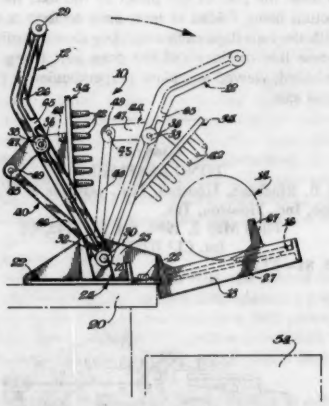
CHOPPING AND SHREDDING DEVICE

Frank W. Jones, Greenville, Del., assignor to Alco Foodservice Equipment Company, Wilmington, Del.

Filed Sep. 11, 1980, Ser. No. 186,119

Int. Cl.³ B26D *3/26, 4/18*

U.S. Cl. 83—431 3 Claims



1. In a chopping and shredding device for chopping and shredding objects such as lettuce heads by a finger-carrying pusher that pushes the heads down through a set of cutting blades, the improvement according to which the device has an integral elongated aluminum base frame one end of which has mounting means for securing to the edge of a table and the other end of which is an upwardly inclined blade-supporting section that projects beyond the table edge to which the frame is secured, the pusher is carried on an elongated operating handle one end of which is pivoted to a relatively low location

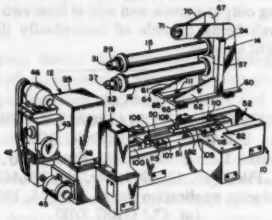
on the mounting-means-carrying end of the frame spaced from the blade-supporting section so that a lettuce head will be received between that section and the pusher when the operating handle is pivoted away from that section but is not yet vertical, the pivoting of the handle permits it to pivot away beyond the vertical, a pusher tilting linkage is pivotally connected to the pusher and to the mounting-means-carrying end of the frame at a location above that to which the operating handle is pivoted, to adjust the tilt of the pusher as it pushes its fingers through the cutting blades, the tilting linkage being on the side of the handle remote from the blade-supporting section of the frame to help counterbalance the handle when it is pivoted away just beyond the vertical, and stop means is provided to keep the handle from pushing the pusher too far into the cutting blades.

4,346,635

SLITTER WITH REMOVABLE HEAD

Ferdinand A. Krauss; Ivan S. Ganyard, both of Bay Village, and Raymond E. Sabbatis, North Olmsted, all of Ohio, assignors to Loopco Industries, Inc., Twinsburg, Ohio

Filed Nov. 5, 1979, Ser. No. 91,115
Int. Cl.³ B26D *1/24;* B23D *19/04*
U.S. Cl. 83—479 **6 Claims**



1. A slitter comprising a pair of arbors; a drive housing and idle housing supporting said arbors at opposite ends respectively; a base on which said drive and idle housings are mounted; and means to move said idle housing horizontally away from said drive housing to disconnect said arbors from said drive housing for removal of said idle housing and arbors from the slitter; said idle housing including a vertically movable journal for one of said arbors, a jack for said journal, said means to move said idle housing being operative to disconnect said jack from said vertically movable journal and vice versa; said idle housing also including a slide mounted on said base, and said means to move said idle housing including a horizontally movable actuator for said slide mounted on said base; and positioning means, including a hole and a slot, on said idle housing slide adapted to position said idle housing on said actuator in a predetermined position and alignment for such horizontal movement; said actuator including upwardly projecting pilot pins adapted to fit within said hole and slot, respectively.

4,346,636

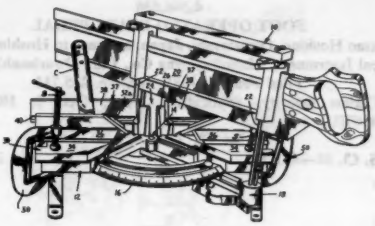
APPARATUS FOR MITERING MOLD AND THE LIKE

Elizabeth C. Taylor, 1989 Queens Way, NE., Atlanta, Ga. 30341

Filed Dec. 19, 1979, Ser. No. 105,031
Int. Cl.³ B27G *5/02*
U.S. Cl. 83—767 **10 Claims**

1. In a device for supporting decorative mold and the like having a mold face to be cut along a predetermined line, such as is used for back-mitering a strip of mold, on a substantially flat base having a saw thereon which may be set as to angularity of cut and controlled during sawing to move in a preselected path:

a profile support means comprising a profile support member having length and width and a profile thereon with the length and width corresponding to the length and width of portions of the mold face and the like, means for supporting said profile support means at a predetermined, pre-selected angle on said base including the angle at which a mold is installed and for retaining same in position thereon whereby said profile support means supports a mold at the angle corresponding to the angle of installation, said mold being placed coextensively into engagement with the profile of the face of the mold engaged with



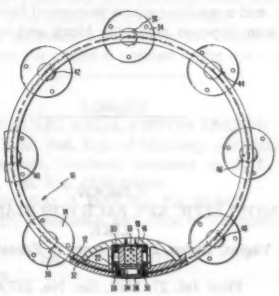
the profile of said profile means, the top of the mold being adjacent to and supported by an upper part of the profile member and the bottom of said mold being supported against said profile member at a location toward said base spaced from said upper part, means for retaining said profile support member and said mold in engagement during cutting, and means for removably retaining said profile support means on said flat base.

4,346,637

SPIN-JANGLE TAMBOURINE

Bryan L. Janszen, 60 Candlewood Dr., Yonkers, N.Y. 10710

Filed Dec. 8, 1980, Ser. No. 214,209
Int. Cl.³ G10D *13/02*
U.S. Cl. 84—418 **26 Claims**



1. A tambourine comprising (1) a frame having window means therein; (2) cymbal means adapted for generating sound and mounted on said frame in said window means; (3) activator means mounted on said frame operatively engaging said cymbal means for moving said cymbal means and to cause said cymbal means to generate sound; and (4) spinning means mounted on said frame for rotating said frame about its latitudinal axis, said spinning means being operatively associated with said activator means to cause said activator means to move said cymbal means;

wherein said activator means comprise flexible shaft means which can be rotated about its longitudinal axis when in a flexed configuration, said flexible shaft means being mounted on said frame and extending from said spinning means to said window means, striking means mounted on said shaft means is rotated on its longitudinal axis, said

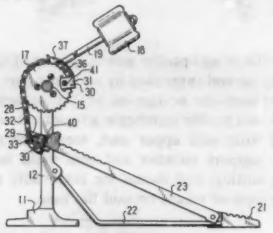
spinning means operatively engaging said flexible shaft means for rotating said flexible shaft means about its longitudinal axis.

4,346,638

FOOT OPERATED DRUM PEDAL

Masao Hoshino, Owariasahi, Japan, assignor to Hoshino Musical Instrument, Manufacturing Co., Ltd., Owariasahi, Japan

Filed Feb. 18, 1981, Ser. No. 235,711
Claims priority, application Japan, Oct. 9, 1980, 55-144367[U]
Int. Cl.³ G10D *13/00*
U.S. Cl. 84—422 R 2 Claims



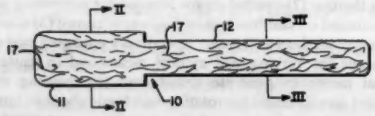
1. A foot-operated drum pedal, comprising a sprocket, and a chain connecting between the sprocket and the toe end of a pedal element, wherein a block and an inverse U-shaped bracket are attached respectively to both ends of the chain using pins, and wherein said block is screwed to the toe end of the pedal element, said bracket is screwed to and grips the sprocket, and a machine screw is inserted between the rollers of the chain disposed along the block and screwed into the block.

4,346,639

THERMOPLASTIC KEY FACE FOR PIANOS OR THE LIKE

Alex M. Vagias, Baden, Pa., assignor to Ernest Vagias, Baden, Pa.

Filed Jul. 27, 1981, Ser. No. 287,432
Int. Cl.³ G10C *3/12*
U.S. Cl. 84—437 7 Claims



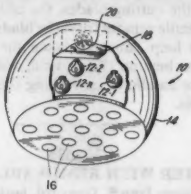
1. A key cover plate for pianos and the like comprising injection-molded thermoplastic material marbleized by incomplete mixing of a color agent to simulate the grain of natural ivory, the marbleized thermoplastic material having a Munsell hue of between 8.8Y to 6.6YR, a Munsell chroma of between 1.0 to 2.6, a Munsell value of between 8.3 and 9.3 and a contrast ratio of between 70 and 90.

4,346,640

DECORATIVE LIGHT FLASHING APPARATUS AND ACOUSTO-ELECTRIC TRANSDUCER THEREFOR

John R. Zeno, New York, and William Rosenhagen, Ossining, both of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Filed Nov. 26, 1979, Ser. No. 97,257
Int. Cl.³ A63J *17/00*
U.S. Cl. 84—464 R 6 Claims



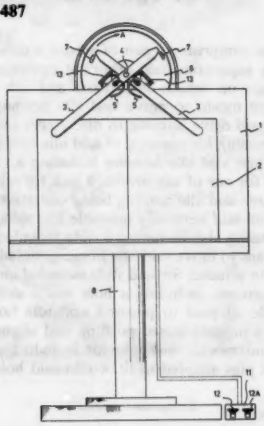
1. A decorative light flashing apparatus comprising: acousto-electric transducer means for preferentially responding to impulse-type sounds; triggerable means responsive to said transducer means for producing pulse-type signals; means responsive to said pulse-type signals for producing at least two commutating output signals; and said at least two commutating output signals being capable of individually illuminating at least two light sources.

4,346,641

APPARATUS FOR AUTOMATICALLY TURNING THE PAGES OF A MUSIC BOX

Itaru Kobayashi, 1-15-2, Motomachi, Kiyose City, Tokyo, Japan

Filed Feb. 17, 1981, Ser. No. 234,462
Claims priority, application Japan, Feb. 14, 1980, 55-17312
Int. Cl.³ G10G *7/00*
U.S. Cl. 84—487 3 Claims



1. An apparatus for automatically turning over pages of a music book consisting of:

a music book stand,

a number of page turning slats piled one over another and pivoted at the top of said music book stand, each of said slats being adapted to be inserted obliquely between every two pages of a music book and adapted to swing around said pivot between two side barriers, a gear having a number of slits arranged circumferentially and adapted to engage with the upper ends of said slats in succession during its rotation,

an electric motor for driving said gear controlled by an ordinary and a reversible switch, and

a detachable stool.

4,346,642

FASTENING DEVICE FOR EXTERNALLY COUPLING LOADS ON AIRCRAFT

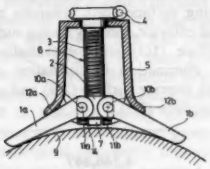
Heiko Uhle, Egmating, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany

Filed Mar. 24, 1980, Ser. No. 133,479

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1979, 2911603

Int. Cl.³ B64D *1/04;* F41F *5/02*

U.S. Cl. 89—1.5 B 10 Claims



1. A fastening device for externally coupling suspended loads on aircraft comprising a pair of support arms, a lifting device arranged between said support arms and having said support arms fastened thereto in an articulated manner, and abutment means rigidly connected with said aircraft, said support arms being arranged to be actuated by said lifting device to be drawn thereby for abutment against said abutment means and to be clamped against an external load by the action of said lifting device drawing said arms against said abutment means.

4,346,643

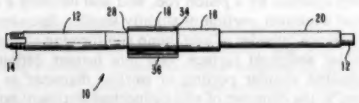
THERMAL JACKET FOR ELONGATED STRUCTURES

Peter F. Taylor, Agoura; Harold J. Tuchyner, Pacific Palisades; Algerd Basiulis, Redondo Beach, and Thomas R. Lamp, Torrance, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 7, 1979, Ser. No. 101,316

Int. Cl.³ F41F *17/00*

U.S. Cl. 89—14.1 9 Claims



1. An arrangement for reducing non-symmetrical, thermally induced strains in a gun tube comprising a heat pipe jacket including a pair of clam-shell envelopes with working fluid therein which extend lengthwise of and in thermal engagement with said gun tube and which have both radial and circumferential conductivity, respectively for conducting heat away from and for equalizing temperature gradients about said gun tube, each of said envelopes including an elongated curved inner wall in contact with said gun tube, an elongated curved outer wall spaced from and generally parallel to said inner wall, side and end walls extending between and sealed to said inner and outer walls to establish a generally half cylindrical vapor space in each of said shells, and a wick on said walls surrounding the vapor space.

4,346,644

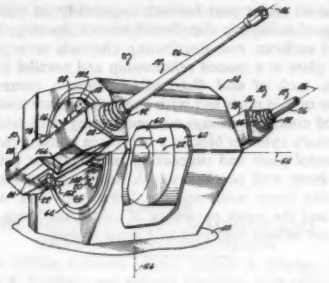
FOLDOUT CRADLE APPARATUS FOR MOUNTING AN AUTOMATIC CANNON TO A TURRET EXTERIOR

Vernet F. De Haven, and Forrest Airhart, both of Huron, Ohio, assignors to Ares, Inc., Port Clinton, Ohio

Filed Feb. 19, 1980, Ser. No. 122,661

Int. Cl.³ F41F *21/14*

U.S. Cl. 89—37 B 23 Claims



1. In a weapons system including a gun turret having an exposed member pivotally mounted on an elevational axis and at least one automatic cannon, cradle apparatus for mounting the cannon to said member, which comprises:

(a) a rigid, cannon receiving cradle;

(b) first, second and third mounting means arranged in a triangular configuration for mounting the cradle to said member for pivotal cradle movement relative thereto between closed and open positions,

said first mounting means including latching means for releasably latching the cradle to said member,

said second and third mounting means including hinging means defining a cradle hinge line therethrough and enabling the cradle to pivot about said hinge line between the closed and open positions when the latching means is in an unlatched condition; and

(c) means for mounting a cannon in the cradle for access thereto when the cradle is pivoted to the open position.

4,346,645

HYDRAULIC AXIAL PISTON ENGINE

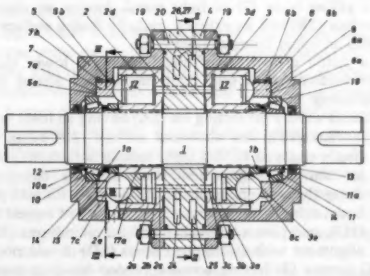
Peter Wüsthof, Lohr, Fed. Rep. of Germany, and Sinclair Cunningham, Kinghorn, Scotland, assignors to G. L. Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Nov. 2, 1979, Ser. No. 90,643

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1978, 2847952

Int. Cl.³ F01B *13/04*

U.S. Cl. 91—501 5 Claims



1. A hydraulic axial piston engine comprising: a rotary shaft;

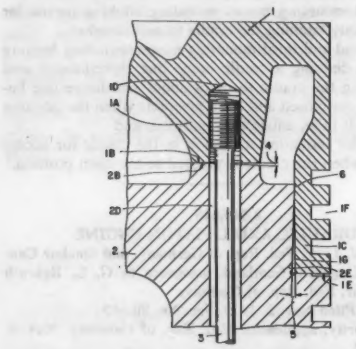
a pair of stationary lifting cams defining two facing cam surfaces arranged around said shaft; two rotary cylinder blocks supported for joint rotation on said shaft and each having a plurality of uniformly distributed and axially directed blind bores; through passages provided in the end wall of each blind bore to admit and discharge a working liquid into respective bores; two sets of working pistons arranged for reciprocating movement in said bores in contact with said cam surfaces; a stationary control plate of a substantially ring-shaped configuration defining a jacket and two annular end surfaces, an inlet port and an outlet port formed, respectiely, in said jacket, a plurality of uniformly distributed control openings formed in said end surfaces, two distributing channels arranged in said control plate at a spaced relationship and parallel to said end surfaces, each of said distributing channels communicating with one of said ports and with a set of alternate control openings; said control openings communicating with said passages in the rotary cylinder blocks; a two-piece housing mounted on said control plate and supporting said shaft for rotation and having inner wall portions which fixedly support said lifting cams, said inner wall portions being provided with inner splines and the outer periphery of said cams being provided with outer splines engaging said inner splines.

4,346,646

PISTON FOR INTERNAL COMBUSTION ENGINES

Jürgen Ellermann, Schwaikheim, Fed. Rep. of Germany, assignor to Mahle GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 956,156, Oct. 31, 1978, abandoned.
This application Jul. 21, 1980, Ser. No. 170,622
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1977, 2758378
Int. Cl.³ F02F *3/02*; F16J *1/00*
U.S. Cl. 92—220 **3 Claims**



1. A piston suitable for an internal combustion engine, comprising:

(a) a piston body (2) of light metal, having an abutment surface (2B) and an exterior, radially facing surface (2E) with an upper outer annular edge;

(b) a piston crown (1) of metal having a lower thermal conductivity than said light metal, said piston crown including:

(i) an inwardly projecting rib (1A) having an inner seating surface (1B), said abutment surface (2B) being abuttingly engaged to said inner seating surface to provide an abutting engagement, said abutting engagement being the sole engagement of said rib with said piston body, said rib having therein a plurality of tapped bores (1D), said piston body (2) having therein bores (2D) in alignment with said tapped bores (1D) in said rib;

(ii) screws (3) having screw-threaded heads engaged in said tapped bores (1D); and

(iii) an annular skirt (1C) having a free end (1E), said free end (1E) engaging a radially directed surface of said piston body, said annular skirt being axially spaced from said rib (1A); and

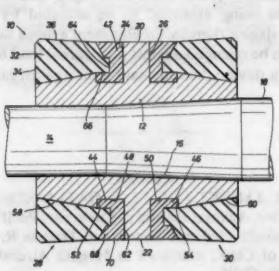
(c) means for substantially preventing creation of frictional rust between said annular skirt (1C) and said piston body (2), said means being comprised of an interior surface (1G) of said annular skirt abuttingly engaged, when said piston is at ambient non-working temperature, with said exterior, radially facing surface (2E) of said piston body only in the region (6) of said annular skirt which is adjacent to the upper outer annular edge of the piston body, said exterior, radially facing surface (2E) being spaced from said interior surface (1G) by a gradually increasing radial distance towards said free end (1E) of said annular skirt, said radial distance being reduced upon increase in working temperature of said piston to bring about complete radial surface contact between said inner surface (1G) and said exterior, radially facing surface (2E), whereby micro movements between said exterior, radially facing surface (2E) and said interior surface (1G) are substantially prevented with consequent elimination of formation of frictional rust between said interior surface (1G) and said exterior, radially facing surface (2E).

4,346,647

PISTON CONSTRUCTION FOR RECIPROCATING PUMPS

Joe T. Weaver, Midland, Tex., assignor to Weaver Manufacturing Company, Midland, Tex.

Filed Feb. 20, 1981, Ser. No. 236,624
Int. Cl.³ F16J *9/12*
U.S. Cl. 92—243 **16 Claims**



1. A pump piston construction for a reciprocating type pump having a pump cylinder, said pump piston comprising:

a one piece piston hub adapted to be reciprocated within said pump cylinder by a piston rod, said hub defining a cylindrical abutment portion of slightly smaller diameter than an unworn cylinder of said pump and forming at least one annular abutment surface, said hub further defining an elongated annular portion of smaller diameter as compared to the diameter of said cylindrical abutment portion, said hub defining an internal passage extending through said elongated annular portion and said abutment portion and receiving said piston rod therein, said elongated annular portion defining locking groove means in the outer peripheral portions thereof, said locking means being located on coposed sides of said cylindrical abutment portion, said elongated annular portion further defining seal guide surface means defining a small dimension at the ends of said hub and a larger dimension at said locking groove means;

an annular piston seal ring composed of elastomeric material and being positioned about a portion of said hub, said piston seal ring defining an inner peripheral portion having mating relation with said elongated annular portion and being in intimate assembly with at least a portion of said elongated annular portion, said piston seal ring futher

defining a tapered outer surface portion that is yielded radially inwardly upon insertion into said pump cylinder, said piston seal ring also defining an intermediate annular axially projecting portion;

an annular anti-extrusion member being positioned about a portion of said hub and being interposed between and in intimate assembly with said piston seal ring and said abutment surface, said anti-extrusion member having an outer generally yieldable axially extending flange portion formed and being positionable in justaposed relation with said pump cylinder, said yieldable flange portion of said anti-extrusion member being located radially outwardly of said axially projecting portion of said piston seal ring and being yieldable radially outwardly into bearing contact with said pump cylinder responsive to pressure transmission through said axially projecting portion of said piston seal ring and preventing pressure induced extrusion of the elastomeric material of said piston seal ring in the annular space between said piston hub and cylinder, said anti-extrusion member defining an inner peripheral locking portion of smaller internal dimension as compared to said larger dimension of said seal guide surface means and being formed of material having sufficient elasticity to expand and pass over said tapered guide surface and to retract to the original dimension thereof, said inner peripheral locking portion being received in mechanically interlocked relation within said locking groove means, said anti-extrusion member further defining an annular intermediate groove between said outer flange portion and said inner peripheral locking portion, said intermediate axially extending portion of said piston seal ring being received in mating relation within said annular intermediate groove.

4,346,648

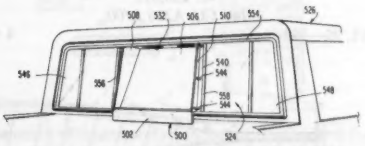
ATTACHMENT FOR MOTOR VEHICLES WITH REAR WINDOWS

Richard Chatlos, Johnstown, Pa., assignor to Air O Scoop Corporation, Johnstown, Pa.

Continuation-in-part of Ser. No. 118,444, Feb. 4, 1980, Pat. No. 4,326,451. This application Oct. 6, 1980, Ser. No. 194,224

Int. Cl.³ B60J *1/20*

U.S. Cl. 98—2.12 **2 Claims**



1. An air flow device for a closed motor vehicle or boat for positioning in the rear aperture thereof, said rear aperture containing a window frame, two outer window sections which are stationary and mounted in the end portions of said window frame, said two outer window sections being of such size as to form an opening therebetween, and two inner window sections which are slidably mounted in said window frame, said two inner window sections being of such size as to close off said opening when said two inner window sections are slid together and to fully open said opening when said two inner window sections are slid sufficiently far apart, which comprises a base plate, means attached to said base plate for attaching said device to the bottom portion of said window frame, two vertical side plates, each having one end attached to the end of the base plate, a top plate attached to the other end of each of said vertical side plates at a position back from the side of said two vertical side plates so that part of the device extends through the opening, the top plate contacting the inside surface of the top portion of said window frame, a back plate which is attached at its bottom to the portion of said base plate inside of said motor vehicle and is positioned with its top away from said top plate or the vertical plane of said opening thereby forming a gap between the top plate and said back plate, and two vertical side strips, each attached at a right angle to one of said vertical side plates, the unattached vertical edge of each of said vertical side strips aligning with the end of one of said outer window sections, the end of each of said inner window sections slidably fitting behind one of said vertical side strips thereby holding said device in position and preventing inward motion of said device, at least said back plate being transparent, said two side plates being generally triangular in shape, being attached on one edge to said back plate and preventing lateral air flow.

4,346,649

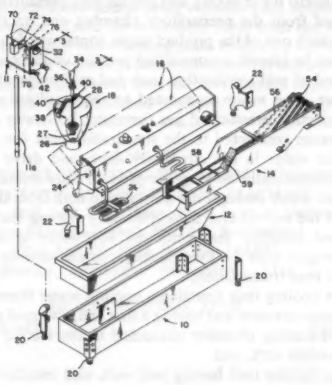
DOUGHNUT MAKING MACHINE AND IMPROVEMENTS THEREON

Wilbur D. Wilke, Camano Island; Archie A. Hodge, Renton; Thomas E. Belshaw, and John R. Hamblin, both of Seattle, all of Wash., assignors to Belshaw Bros., Inc., Seattle, Wash.

Filed Apr. 28, 1980, Ser. No. 144,684

Int. Cl.³ A47J *37/12*

U.S. Cl. 99—337 **11 Claims**



1. In a doughnut frying machine of the type having a hopper, a cutter for forming doughnuts, a hot liquid frying tank, a conveyor for carrying the doughnuts through the frying tank, cutter drive means, conveyor drive means and control means for actuating the cutter and conveyor drive means, the improvement comprising:

a hopper stand adjacent one end of said frying tank, said cutter drive means located on said hopper stand for operating said cutter, hopper support means on said stand a predetermined distance from said cutter drive means;

said hopper including bracket means releasably engaged by said hopper support means for accurately removably locating said hopper on said stand;

said hopper having a doughnut dispensing opening, said cutter including a piston for closing and opening the dispensing opening, said piston including rod means releasably engaged by said cutter drive means for actuating said piston to dispense the doughnuts; and

wherein said hopper is easily removed from said stand for filling and/or cleaning by releasing said hopper bracket means and said rod means and is restored to its operating position on the stand without adjustments.

4,346,650

CONTINUOUS-PROCESSING TYPE HOT-WATER STERILIZER AND FOOD COOKER

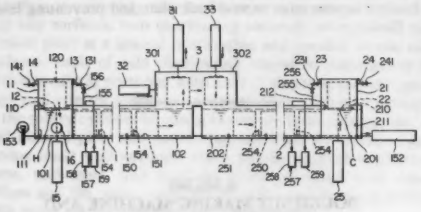
Eizo Zaitsu, Nara, Japan, assignor to Shinagawa Machinery Works Co., Ltd., Osaka, Japan

Filed Sep. 10, 1980, Ser. No. 185,896

Claims priority, application Japan, Oct. 5, 1979, 54/129245

Int. Cl.³ A47J *27/08*

U.S. Cl. 99—361 **11 Claims**



1. A hot-water sterilizer and cooker of the continuous processing type for sterilizing and cooking food in packages held in product cages comprising

(1) a sterilization tank containing hot water therein under a given pressure, said tank including a first end, a second end, a preparatory chamber having pipe means connected thereto for injecting and discharging pressurized gas into and from the preparatory chamber and an elevator on which one of the product cages containing food packages can be placed, a connecting portion connecting said first end of said sterilization tank and said preparatory chamber, pipe means connected to the sterilization tank for injecting pressurized gas thereinto, hot-water circulation means connected to the sterilization tank for circulating hot water in the circulation tank, and drive means for intermittently moving the product cage immersed in the hot water through the sterilization tank from the first end to the second end thereof thereby stirring the hot water and ensuring that sufficient hot water is in constant contact with the food packages to enhance the efficiency of heat transmission,

(2) a cooling tank containing cooling water therein under a given pressure and having a first end, a second end, and an off-loading chamber connected to the second end of the cooling tank, and

(3) a transfer tank having two ends, said transfer tank being connected at one end thereof to said second end of the sterilization tank and at the other end thereof to said first end of the cooling tank.

4,346,651

TOASTER FOR BREAD AND OTHER FOOD ITEMS

Willi Schickedanz, Langener Strasse 70, 6050 Offenbach am Main, Fed. Rep. of Germany

Filed May 17, 1979, Ser. No. 39,760

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1978, 2844650

Int. Cl.³ A47J *37/08*

U.S. Cl. 99—392 **2 Claims**

1. A toaster for bread and other food items, comprising

a casing having at least two generally parallel upright walls defining with one another an upright space dimensioned to receive food items to be toasted, said walls having downwardly directed lower edge faces;

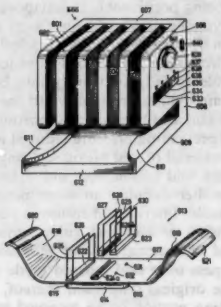
a base beneath said casing and having an upper surface spaced from and defining with said lower edge faces a clearance which is open to said spaces;

discrete carrier means insertable into and removable from said clearance and including holding means projecting from said clearance into said space for holding food items in requisite orientation;

means for causing a food item on said carrier means to enter into said space and to be extracted therefrom;

means for toasting food items which are located in said space; and

cooperating guide portions on said casing and carrier for guiding the latter during said relative movement, said casing including a housing and downwardly spaced therefrom said base having an edge and on which said housing is mounted, said carrier being insertable between said base and housing; and wherein said guide portions include at least one groove formed in said base and having a cross-section which diverges in direction towards said edge in the region inwardly adjacent the same.



4,346,652

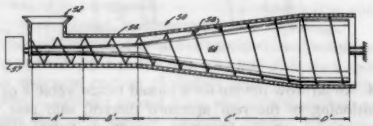
APPARATUS FOR MAKING A MEAT ANALOG

Peter W. A. de Ruyter, 3480 Rang des Soixante, St. Jean Baptiste de Rouville, Quebec, Canada (J0L 2B0)

Continuation-in-part of Ser. No. 83,330, Oct. 10, 1979, abandoned, which is a division of Ser. No. 940,108, Sep. 6, 1978, abandoned, which is a division of Ser. No. 791,137, Apr. 26, 1977, Pat. No. 4,125,635. This application Apr. 22, 1981, Ser. No. 256,612

Int. Cl.³ A23J *3/00*

U.S. Cl. 99—483 **4 Claims**



1. In an apparatus for texturizing protein products, which apparatus includes:

a screw conveyor for simultaneously treating protein and moving it from one end of the conveyor to another end of the conveyor, the screw conveyor including an elongated barrel and an elongated rotatable screw means therein, the screw means comprising a screw root having helical flights therearound;

means forming a protein inlet at said one end of said screw conveyor;

means forming a protein outlet at said other end of said screw conveyor;

means for rotating said elongated rotatable screw; and

means for heating at least a portion of said screw conveyor;

the improvement wherein said screw conveyor includes a protein stretching portion, the elongated barrel in said stretching portion having an increasing internal diameter,

the screw of said screw means in said stretching portion also having an increasing diameter, the rate of increase in the diameter of the screw root being greater than the rate of increase in the internal diameter of the barrel, the helical flights of said screw in said stretching portion having decreasing helix angles therebetween, the pitch of the screw in the stretching section remaining substantially constant, the cross sectional area between the screw root and the barrel remaining substantially constant, such that the conveying capacity of said screw conveyor in said stretching portion remains substantially constant for each 360° turn of the screw therein and such that a protein product passing therethrough will be stretched in a curvilinear manner.

4,346,653

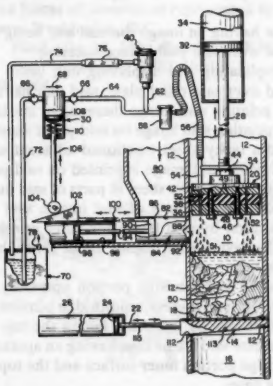
METHOD AND APPARATUS FOR REFUSE DISPOSAL

Edward Rodak, York, Pa., assignor to General Defense Corporation, Red Lion, Pa.

Filed Feb. 22, 1980, Ser. No. 123,705

Int. Cl.³ B30B *9/04, 13/00*

U.S. Cl. 100—37 **39 Claims**



1. A method of treating refuse including components that are porous and contain trapped air, comprising depositing such refuse in a chamber; supplying sufficient liquid to such chamber to assure substantially even fluid pressure throughout such refuse, which liquid has sufficiently low viscosity and surface tension to be capable of being forced into the pores of such porous components; and applying fluid pressure throughout such liquid adequate to impregnate enough liquid into such pores to increase the density of such porous components to a value greater than that of water.

13. Apparatus for treating refuse including components that are porous and contain trapped air comprising means forming a refuse receiving chamber; means for supplying fluid to said chamber and for determining when there is sufficient fluid in the chamber to transmit substantially even fluid pressure throughout such refuse deposited therein; means for raising the fluid pressure within the chamber to apply a substantially uniform fluid pressure throughout refuse deposited therein, such pressure being adequate to impregnate such fluid into the interstices of such porous refuse components for rendering them more dense than water; and means for removing the treated refuse from said chamber.

4,346,654

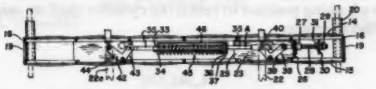
APPARATUS FOR APPLYING PRESSURE IN A VERTICAL DIRECTION

Gerald J. Orlowski, Scottsdale, Ariz., and Thomas Dugle, Cincinnati, Ohio, assignors to Armour and Company, Phoeniz, Ariz.

Division of Ser. No. 963,909, Nov. 24, 1978. This application Jul. 2, 1979, Ser. No. 54,287

Int. Cl.³ B30B *1/00*

U.S. Cl. 100—268 **4 Claims**



1. Apparatus for applying a predetermined pressure in a vertical direction comprising a rod extending horizontally and being axially movable, means responsive to the axial movement of said rod for increasing the pressure applied by the apparatus in the vertical direction until the applied pressure attains said predetermined pressure, a screw extending horizontally and movable axially when it is turned, means responsive to axial movement of said screw for moving said rod axially to actuate said first mentioned means until said predetermined pressure is attained, said last mentioned means including a coil spring extending about said rod and a retaining plate secured to said rod, said last mentioned means being capable when responding to axial movement of said screw to apply force from end to end of said spring against said retaining plate to thereby move said rod only when the vertical pressure developed is less than said predetermined pressure so to limit the development of pressure greater than said predetermined pressure.

4,346,655

DEVICE FOR EXCHANGING THE FORM CYLINDER IN A PHOTOGRAVURE ROTARY MACHINE

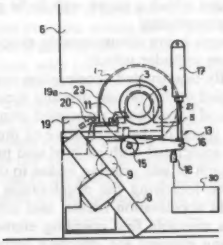
Fritz Suter, Boll, and Paul Haag, Bern, both of Switzerland, assignors to Maschinenfabrik WIFAG, Switzerland

Filed Apr. 29, 1980, Ser. No. 144,959

Claims priority, application Switzerland, May 7, 1979, 7903974

Int. Cl.³ B41F *9/18, 13/20*

U.S. Cl. 101—153 **4 Claims**



1. A device for changing a form cylinder of a photogravure rotary machine, the cylinder having a shaft with a bearing at each end and a removable bearing housing engaged over each shaft bearing, the machine having a machine control and machine side walls, comprising: a guide connected to each of said side walls, a carriage slidably mounted on each of said guides for movement into and out of an operating position, said carriage having a saddle portion shaped for receiving a respective bearing housing, said carriage slidable along said guide into its operating position to bring a respective bearing housing on a respective saddle portion into an operating position for the

form cylinder, a retaining fork pivotally mounted to each carriage and movable into an engagement position engaging a respective bearing housing to hold the respective bearing housing at a fixed axial position on a respective saddle portion, locking means connected to the side walls and engageable with said carriage in its operating position, for retaining said carriage in its operating position, an inclined member having an upper inclined surface position for engaging the cylinder shaft with said carriage moved out of its operating position, said inclined member connected to said side walls and spaced from said operating position of said carriage, and a return feed ratchet pivotally mounted to said inclined member movable into a locking position to retain the cylinder shaft on said upper inclined surface.

4,346,656

DEVICE FOR MAKING PRINTED MATTER WITH CHANGING IMPRINTS

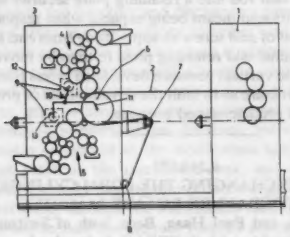
Manfred Schwaab, Ludwigshafen-Oggersheim; Helmut Puschnerat, Worms, and Kurt Storz, Neutrauchburg, all of Fed. Rep. of Germany, assignors to Albert-Frankenthal, AG, Frankenthal, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 84,328, Oct. 12, 1979, abandoned. This application Apr. 17, 1981, Ser. No. 255,150

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1978, 2844418

Int. Cl.³ B41F *7/10, 13/46*

U.S. Cl. 101—181 **8 Claims**



1. In a machine for making printed matter with changing imprints or for adding additional printing to a completed print with further printing units which comprises two independently operated and actuated printing means and a common counterpressure cylinder with which said printing means coact and at least partially around which a paper web to be printed is fed, the improvement comprising:

said printing means being disengageably coupled with said counterpressure cylinder which;

a pair of normally deactivated acceleration motors, each of which is coupled to one of said printing means and which may be activated to bring the associated printing means to the operating speed of the main drive of the machine;

coupling means associated with each of said printing means for coupling each of said printing means to the main drive of the machine following the acceleration process performed by said acceleration motor, said coupling means each having a movable first coupling element and fixed second coupling element for effecting coupling and uncoupling of the associated printing means;

adjustment means associated with each of said coupling means for actuating said first coupling elements between said coupling and uncoupling positions thereof; and

a drive assembly for each of said printing means which includes a main drive shaft on which said counter pressure cylinder is mounted, a main drive gear affixed on said main drive shaft for effecting rotation thereof, a pair of drive pinions for driving said printing means, each of which is supported for free rotation on said main drive shaft in a fixed axial position thereon, each of said drive pinions having said second coupling element of the associated coupling means rigidly affixed thereto which is disposed for engagement with the associated movable first coupling element, and said movable first coupling element being supported in an axially adjustable and non-rotatable manner on said main drive shaft and being coupled to said associated adjustment means.

4,346,657

DUPLICATION PRINTER

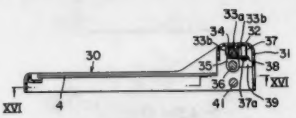
Hiroyasu Okutsu, Zama, Japan, assignor to Pilot Man-Nen-Hitsu Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 12, 1980, Ser. No. 158,712

Claims priority, application Japan, Jun. 18, 1979, 54-83960[U]

Int. Cl.³ B41F *3/04*

U.S. Cl. 101—269 **8 Claims**



1. A duplication printing device comprising:

a movable base having a cushioning material on an upper surface thereof and a holding frame, said holding frame having a window opening therethrough and being removably superimposed over the upper surface of said movable base;

a relief plate having an image thereon and being removably positioned over said cushioning material;

an image duplicating and displaying unit being removably positioned over said relief plate, said unit having a paper sheet for printing said image thereon, an ink layer means for relief printing said image on said paper sheet, a display sheet, and a tacky sheet positioned adjacent said display sheet for, when said image is printed on said paper sheet, adhering to said display sheet at parts of said display sheet positioned over the parts of said image, said unit being held in position by said frame for relief printing and for visually displaying said display sheet through said window opening;

a frame case having a bridge portion upwardly extending from a top surface thereof, said bridge portion having an inner surface spaced from and facing the top surface of said frame case said frame case having an aperture defined by said bridge portion inner surface and the top surface of said frame case;

said movable base slidably extending through said aperture and slidable toward and away from said frame case;

a rotatable pivot rod extending across said aperture;

a mounting means for rotatably mounting the ends of said pivot rod on said bridge portion, said mounting means including two sets of ribs one at each opposite end of said pivot rod, and two retainers, one associated with each set of ribs, each set of ribs being integrally formed with the inner surface of said bridge portion and being spaced apart from one another, the ribs of each set extending from said inner surface and being spaced apart and rotatably accommodating said pivot rod therebetween, each of said retainers being connected to said bridge portion and respectively extending transversely across the space between the ribs of each set, said pivot rod being rotatably accommodated between each of said retainers and said inner surface;

said pivot rod respectively having swing links thereon and extending downwardly therefrom toward said frame case, the free ends of said links being movable around the longitudinal axis of said pivot rod between a first position and a second position;

said frame case having at least one stop operatively associ-

ated with said swing links for, when said free ends are pivoted to said first position, abutting said swing links for preventing said swing links from pivoting further in one direction; and

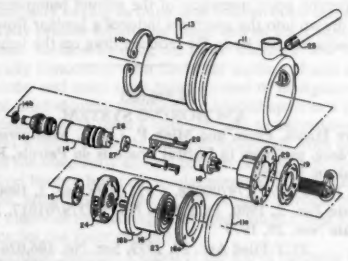
a pressure bar connected to said free ends of said swing links for, when said movable base is slid away from said frame case, frictionally engaging a top surface of said unit for pivoting said swing links to said first position and for causing said bar to press firmly against and slide over the top surface of said unit, whereby said image is relief printed on said paper sheet, and for, when said movable base is slid toward said frame case, frictionally engaging a top surface of said unit for pivoting said swing links to said second position for causing said bar to cease pressing firmly against the top surface of said unit.

4,346,658

ROCKET MOTOR ARMING-FIRING DEVICE FSU-12/B

Joseph E. Hibbs; Gerald W. Chalmers, both of Ridgecrest, and Walter J. Teixeira, Canyon Country, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 12, 1980, Ser. No. 148,856
Int. Cl.³ F42C *15/06*
U.S. Cl. 102—254 **12 Claims**



1. A arming-firing device for preventing unintentional ignition of a rocket motor, comprising:

a housing defining a plurality of axial vent ports;

a poppet-sleeve squib assembly attached with said housing venting through a plurality of axial ports;

a poppet located within said poppet-sleeve squib assembly preventing axial venting of said arming-firing device in the 'safe' position;

a rotary solenoid having sub-assemblies, switch/indicator assembly and a rotor, having multiple cavities therein and located aft of a solenoid lock ring and forward of said poppet-sleeve squib assembly;

a barrier and sub-assembly having multiple prongs designed to fit said cavities in said rotor located between said rotor and said poppet-sleeve squib assembly;

said barrier interconnected with said poppet-sleeve squib assembly;

a solenoid return spring attachably interconnected to said rotor; and

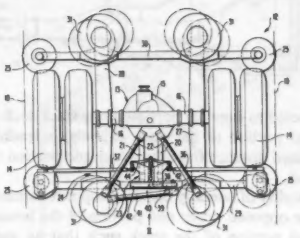
an image conduit viewer attached through said housing providing a viewing surface as to whether device is armed or not.

4,346,659

BI-MODAL MECHANICALLY TRACKABLE ROAD VEHICLE WITH AUTOMATIC AXLE LATCHING MECHANISM

Hellmuth Binder, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 84,613, Oct. 15, 1979, Pat. No. 4,267,779. This application Feb. 19, 1980, Ser. No. 122,478
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1978, 2844626; Feb. 16, 1979, 2905933
Int. Cl.³ B61F *9/00*
U.S. Cl. 104—247 **37 Claims**



1. A bi-modal mechanically trackable vehicle adapted to be driven with or without a guide track, the vehicle including at least one non-steerable axle having non-steerable wheels mounted thereon, at least one tracking transverse guide roller means on each side of the vehicle for guiding the vehicle along a guide track, means for mounting the at least one non-steerable axle on the vehicle so as to be freely pivotable about a vertical axis, means for at least indirectly mounting the at least one transverse guide roller means at the at least one non-steerable axle in an area of the wheels so as to be displaceable transversely of the vehicle within pre-set limits and for participation in the pivotable movement of the non-steerable axle, and means for automatically selectively locking the at least one non-steerable axle in an exact transverse position for driving of the vehicle without a guide track and for unlocking the at least one non-steerable axle from the exact transverse position for driving of the vehicle with a guide track, characterized in that the locking means includes a latch means longitudinally displaceable mounted on the non-steerable axle means, a latch retaining means for engaging the latch means in a substantially shape-mating fashion when the at least one non-steerable axle is in the exact transverse position, means for mounting the latch retaining means on a frame of the vehicle so as to be immovably retainable at least with respect to a transverse direction of the vehicle, and in that means are provided for coupling the latch means to the transverse guide roller means so as to enable the latch means to be longitudinally displaced by the transverse guide roller means to unlock the at least one non-steerable axle for driving on the guide track in response to transverse displacement of one of the at least one guide roller means between said pre-set limits by engagement with a guide track.

4,346,660

SELF-SUPPORTING INCINERATOR AND EXPANDABLE SHIELD THEREFOR

Eugene C. McGill, Skiatook, Okla., assignor to McGill Incorporated, Tulsa, Okla.

Filed Oct. 8, 1980, Ser. No. 195,070
Int. Cl.³ B09B *3/00*
U.S. Cl. 110—235 **20 Claims**

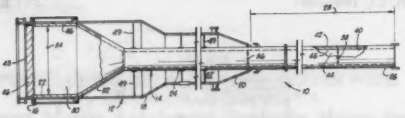
1. An improved, self-supporting incinerator having a combustion chamber for burning sulfur bearing streams therein and adapted to eliminate plume formation resulting from the combustion of such sulfur bearing streams, the incinerator comprising:

a vertically disposed housing having a lower end portion, a medial portion, and an opposed upper end portion;

a vertically disposed elongated stack having a lower end portion, a medial portion, and an upper end portion;

a combustion chamber operably communication with the lower end portion of the stack, the elongated stack and the combustion chamber being concentrically disposed in the housing such that the combustion chamber is disposed substantially adjacent the lower end portion of the housing, the upper end portion of the housing (being connected to a medial portion of the stack such that the upper end portion of the stack extends) extending a predetermined distance from the upper end portion of the housing; and

a plurality of laterally disposed support members connecting the opposed upper end portion of the housing to the medial portion of the stack such that an annular space is formed between the upper end portion of the housing and the medial portion of the stack and the housing serves as an outer shield for the portion of the stack disposed therein.

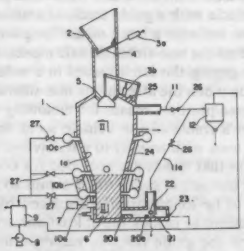


4,346,661

FURNACE FOR TREATING INDUSTRIAL WASTES

Takeo Nakamura, deceased, late of Osaka, Japan (by Fuji Nakamura, heir), assignor to Osaka Gas Kabushiki Kaisha, Osaka, Japan

Filed Mar. 20, 1980, Ser. No. 132,058
Int. Cl.³ F23G *3/00*
U.S. Cl. 110—259 **7 Claims**



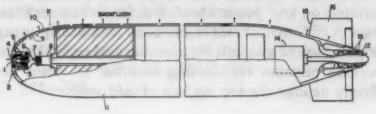
1. A furnace for treating industrial wastes by melting said industrial waste or a semi-treated product thereof comprising a high-temperature bed including an upper portion and a lower portion formed from a combustible carbonaceous material which permits a molten product to be drawn off from said lower portion of said bed, means for supplying a gas for combustion to said high-temperature bed at an intermediate portion between said upper and lower portions of said high temperature bed and means for discharging said combustion gas at an upper and a lower portion of said furnace whereby said combustion gas is caused to flow through said high temperature bed dividedly upward and downward, said means for discharging said combustion gas at the lower portion of said furnace acting also as a discharge outlet for draining off molten products from said furnace.

4,346,662

SELF-CONTAINED BACKFLUSH/START SYSTEM FOR SUCTION LFC UNDERSEA VEHICLE

Kenneth H. Rogers, Corona, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 7, 1980, Ser. No. 147,440
Int. Cl.³ F42B *19/00, 19/26*
U.S. Cl. 114—20 R **12 Claims**



1. In an underwater vehicle having an elongate body including a nose portion and a rear portion including tail fins wherein the improvement resides in providing suction laminar flow control for the outer surface thereof comprising:

water inlet means in a frontal portion and water exhaust exit nozzle means in a rear portion of the vehicle;

apertures about the body in communication with the water;

first pump means selectively operative for drawing water through the inlet means and exhausting a portion thereof out through the body apertures for backflushing the apertures and exhausting the remaining portion out through the exit nozzle means for low speed forward propulsion of the vehicle;

second pump means selectively operative for drawing water in through the body apertures and exhausting it out through the exit nozzle means for high speed forward propulsion of the vehicle;

whereby upon operation of the second pump means water drawn into the apertures induces a laminar flow of water adjacent the body for reduced drag on the vehicle.

4,346,663

ANCHORING SYSTEM

Pierre Habib, Paris, and Minh P. Luong, Montgeron, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

PCT No. PCT/FR79/00038, § 371 Date Jan. 2, 1980, § 102(e) Date Jan. 2, 1980, PCT Pub. No. WO79/01017, PCT Pub. Date Nov. 29, 1979
PCT Filed Apr. 27, 1979, Ser. No. 186,026
Claims priority, application France, May 2, 1978, 78 13299
Int. Cl.³ B63B *21/26*
U.S. Cl. 114—295 **11 Claims**

1. An anchoring system comprising:

an anchor having a profiled shape for permitting complete burying thereof, said anchor comprising at least one plate having a leading edge, and said plate adapted for being retained completely buried;

flexible connection means located on said plate for having a line attached thereto, and adapted for preventing transmission of any substantial moment of rotation to said anchor;

at least one anchor line connected to at least one point of said plate by means of said flexible connection means, said point of connection being located on said plate for causing any force exerted by means of said anchor line to be ap-

plied to said plate at a fixed position forward of the center of mass of the bearing surface of said plate in the direction of displacement of said plate through the ground during positioning thereof;

penetrating means operatively associated with said at least one plate for facilitating penetration of said plate into the ground when traction is exerted on said line; and

inclination means secured to and below said plate for maintaining the leading edge of said plate, when located on the bottom surface, inclined toward the water bottom at an angle of no more than 30° with respect thereto, whereby said inclination means and penetrating means operatively combine with the weight of the plate to maintain the plate inclined at said angle.

4,346,664

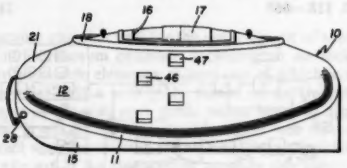
LIFEBOAT

Clayton T. Enzian, Jr., 3 Edgewater Dr., Wareham, Mass. 02571

Division of Ser. No. 881,644, Feb. 27, 1978, Pat. No. 4,274,171. This application Mar. 16, 1981, Ser. No. 244,162

Int. Cl.³ B63C *9/06*

U.S. Cl. 114—349 **5 Claims**



1. Lifeboat comprising:

(a) a main body having an outer skin with an outer surface of generally prolate spheroidal shape and an inner skin with an inner surface forming an inner chamber and being generally concentric with the outer surface of said skins, said outer and inner skins being formed of fiberglass-reinforced, high-density polymer and spaced apart in a parallel relationship to form a compartment therebetween,

(b) a keel formed of heavy material extending from end to end of the main body along a bottom portion, a portion of said keel being a body of circular segmental form in cross-section integrally formed in the bottom portion of the inner chamber and having a flat upper surface that acts as a floor for the inner chamber,

(c) a hatchway aperture located at the top of the main body intermediate of the ends thereof,

(d) a hatch having the general shape of the aperture slidably carried on the main body and movable from a first position where it resides in sealing relation to the aperture to a second position where it is non-coextensive with the aperture, a downwardly-extending apron being integrally formed with both the inner and the outer skins and extending inwardly from the inner surface of the inner skin in the form of a closed plane figure that extends around the hatchway aperture, the apron serving to trap air in the upper portion of the inner chamber, the hatchway aperture and the hatch being of generally rectangular shape and straight guides being integrally formed on the outer skin of the main body parallel to the sides of the aperture to carry the hatch for sliding movement relative to the aperture,

(e) an outwardly and upwardly-extending flange integrally formed on the outer skin surface of the main body in the form of a closed plane figure that extends around and is substantially spaced from the hatchway aperture, the flange serving to inhibit wave flow into the aperture and to collect rain water, and

(f) a hollow ballast element extending entirely around the periphery of the inner chamber at the bottom portion thereof, the element being divided by transverse walls into a plurality of fresh water compartments, the element having a flat upper surface for use as a seat, and a water compartment is provided under the floor at the bottom of the inner chamber.

4,346,665

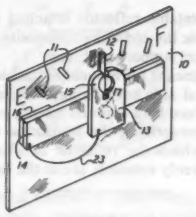
APPARATUS AND METHOD FOR DETERMINING VEHICULAR DISTANCE PER FUEL UNIT

Richard C. McRoberts, 1225 Harrington Dr., Racine, Wis. 53405

Filed Mar. 10, 1980, Ser. No. 128,646

Int. Cl.³ G01D *13/22, 18/00*

U.S. Cl. 116—28 R **15 Claims**



1. In a method for determining vehicular distance traveled per unit of fuel consumed by a vehicle having a distance-traversed odometer and a fuel tank and a fuel gage with a pointer, the steps comprising detachably mounting a selectively horizontally movable reference mark on a support member on the gage and in alignment with the fuel pointer on the fuel gage to thereby present the reference mark for the quantity of fuel to be consumed, noting the distance-traversed reading showing on the distance-traversed odometer, adding a quantity of fuel to the fuel tank to thereby cause the fuel gage pointer to indicate the total quantity of fuel in the fuel tank and noting said total quantity, driving the vehicle for a sufficient distance to cause the fuel gage pointer to return to the reference mark, and noting the total said sufficient distance driven and dividing said sufficient distance by the quantity of fuel previously added to the tank to determine the distance traveled per fuel unit.

4,346,666

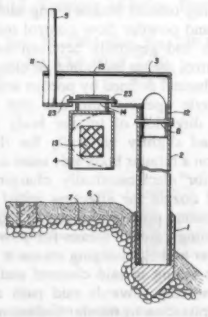
CONSOLE TRAFFIC DIRECTION POST

Basaric Iso, Ul Lastovska br. 1, 41000 Zagreb, Yugoslavia

Continuation-in-part of Ser. No. 107,972, Dec. 28, 1979. This application Jun. 30, 1980, Ser. No. 164,339

Int. Cl.³ E01F *9/00*

U.S. Cl. 116—63 R **6 Claims**



3. A console traffic direction post comprising:

(a) a stake having one end adapted for driving into the

ground and an elongated hollow portion open at the other end for retaining a vertical support post within said stake;

(b) a vertical support post retained within the elongated hollow portion of the stake and extending vertically out from the open end thereof;

(c) a horizontal arm supported at one end on the vertical support post and extending horizontally therefrom;

(d) support means supporting the horizontal arm at one end thereof on the vertical support post comprising a socket allowing the horizontal arm to rotate normal to the vertical support post, and a shear pin extending through said socket, said shear pin preventing rotation of the horizontal arm under normal conditions, but capable of shearing when the horizontal arm is struck, to thereby allow the horizontal arm to rotate normal to the vertical support post;

(e) a freely rotatable reflector attached to said horizontal arm proximate the end thereof opposite the end supported on the vertical support post; and,

(f) attachment means for movably attaching the reflector to the horizontal arm comprising a socket, the opening of which is defined by a cylinder having an inner cylindrical surface circumscribing the horizontal arm and an outer surface to which the reflector is affixed whereby said reflector is freely rotatable about the horizontal arm.

4,346,667

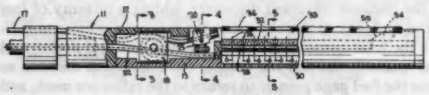
INSIDE POWDER STRIPING APPARATUS

Stanley L. Stamets, South Holland; Robert A. Winkless, Oak Lawn; Rafael J. Hernandez, Chicago; Joseph J. Merle, Oak Lawn, and Robert D. Payne, Countryside, all of Ill., assignors to The Continental Group, Inc., Stamford, Conn.

Filed Dec. 19, 1980, Ser. No. 218,324

Int. Cl.³ B05B *5/02*; B05C *7/02, 19/00*

U.S. Cl. 118—622 **12 Claims**



1. A powder applicator for applying a coating stripe to the exterior of a longitudinal side seam of a tubular body moving along a tubular path and wherein said side seam is generally at the 12:00 o'clock position, said powder applicator comprising a supporting horn, longitudinally extending upwardly directed brushes carried by upper portions of said horn in transversely spaced relation and generally equally spaced on opposite sides of a vertical plane through a longitudinal axis of said horn, said brushes being positioned for engagement with the interior of a tubular body adjacent to said side seam thereof to limit the width of said coating stripe, feed means adjacent said horn for sequentially moving tubular bodies along said horn in closely spaced relation, and powder flow control means in an upper part of said horn and generally between said brushes, said powder flow control means including an elongated longitudinally extending channel defined by porous wall means, a powder applying nozzle opening into one end of said channel generally in the direction of tubular body movement, said nozzle being tilted slightly vertically for directing coating powder directly on a tubular body side seam area between said brushes, means for electrostatically charging said powder delivered to said nozzle for effecting initial adherence of a majority of the coating powder directly to tubular bodies with said channel forming catcher means for powder not initially adhering to tubular bodies, charging means in said channel for charging powder falling in said channel and again directing such powder upwardly towards said path of tubular body movement for application to tubular bodies, means for directing a gas through said wall means for continuously agitating powder within said channel, diverter means in said channel at the end thereof remote from said one end for directing powder reaching said channel remote end vertically out of said channel towards the path.

4,346,668

APPARATUS FOR THE CONTACT-FREE CONTINUOUS MEASUREMENT AND MONITORING OF MAGNETIC TRACKS ON MOVING FILM STRIPS

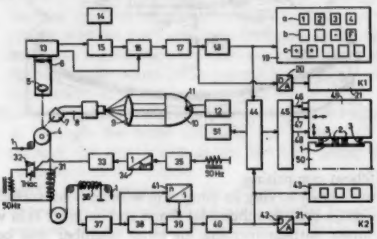
Friedmar Pöhler, Bergisch-Gladbach; Hans Falk, Leverkusen; Josef Müller, Marialinden; Hans J. Klein, Wuppertal, and Franz Hoffacker, Langenfeld, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Division of Ser. No. 21,964, Mar. 19, 1979, Pat. No. 4,276,324. This application Feb. 11, 1980, Ser. No. 120,062

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1978, 2812633

Int. Cl.³ G01N *21/89*

U.S. Cl. 118—665 **21 Claims**



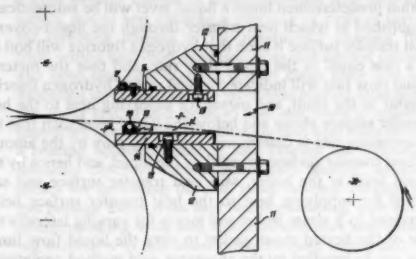
1. An apparatus for substantially continuously measuring and monitoring the width, thickness and position of magnetic tracks on a moving film strip in a manner which is free of contact with the film strip and which is approximately independent of the speed of movement of the film strip, comprising optical means for measuring the magnetic track width and magnetic track position, electromagnetic means for measuring the volume of the magnetic track, the apparatus being further characterized in that the optical means comprises lighting means for the film strip and the magnetic tracks, an electronic camera, projecting means for projecting the illuminated magnetic tracks onto the electronic camera, the electronic camera being constructed and arranged to generate a scanning electrical signal corresponding to width and position of the illuminated magnetic tracks, limit value means generating limit value signals predetermining the edge positions for every magnetic track, comparison means for electrically continuously comparing the scanning electrical signal with the limit value signals whereby the width and position of the magnetic tracks are determined, readout means reading out a difference between the limit value signals and the scanning electrical signals to monitor whether the tracks are of the proper width and correctly positioned on the film strip, the electromagnetic measuring means being further characterized by magnetizing means for magnetizing a portion of the moving film strip by transmitting flux changing magnetic pulses through it, means for measuring a signal generated in response to the magnetic pulses in an adjacent portion of the magnetic tracks on the film strip, and track thickness readout means for reading out the measured signals to determine whether they comply with a predetermined standard which corresponds to the thickness of the tracks.

4,346,669

VACUUM CHAMBER SEALS

Alan H. Hill, Bury, England, assignor to General Engineering Radcliffe 1979 Limited, Radcliffe, England

Filed Oct. 10, 1980, Ser. No. 195,765
Claims priority, application United Kingdom, Oct. 12, 1979, 7935440
Int. Cl.³ C23C 13/10
U.S. Cl. 118—733 12 Claims



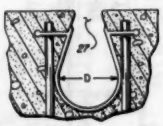
1. A vacuum chamber seal for the entry or exit of a web of material into a vacuum chamber, including an air lock gap defined by adjustable elements, at least one of which is in the form of a roller, and a web guide means on an atmospheric pressure side of the seal, such guide means being so disposed that, in use, it will ensure that one side of the web makes intimate contact with the roller of the air lock gap a short distance from the gap and at the atmospheric pressure side thereof and is maintained in such intimate contact as the web approaches and passes through the air lock gap, the other side of the web being spaced from the other of the adjustable elements.

4,346,670

PREFABRICATED MOLD INSERTS FOR FORMING FLUME PLATFORMS FOR ANIMAL CONFINEMENT PENS AND METHOD OF CONSTRUCTION

Richard E. Bunger, 5202 E. Washington St., Phoenix, Ariz. 85034

Division of Ser. No. 99,913, Dec. 3, 1979. This application Mar. 2, 1981, Ser. No. 239,397
Int. Cl.³ A01K 1/00
U.S. Cl. 119—28 4 Claims



1. A panel for forming at least a part of a platform for confinement pens for livestock comprising:

a ground supported concrete member having a top surface, two sides, two ends and a bottom portion and at least one integrally formed flume forming a passageway therein longitudinally thereof,

said flume opening outwardly of the top surface of said panel along at least a part of its length for receiving therein animal excreta,

the width of said flume opening being substantially narrower than the width of said passageway in said flume,

one end of said flume opening outwardly of one end of said member and forming a discharge port for liquid moving through said flume forming a carrier for the excreta, and

a flexible lining forming a part of said flume,

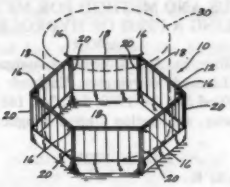
said lining surrounding only the inner periphery thereof below said flume opening terminating below the flume opening with lateral extending flange means at its upper portion extending into the concrete member and held in place by a plurality of stakes engaging the flange means and embedded in the concrete member.

4,346,671

FEED AND ANIMAL ENCLOSURE

Robert L. Wagner, Hampton, Iowa, assignor to Ram Handler, Ltd., Kesley, Iowa

Filed Nov. 10, 1980, Ser. No. 205,264
Int. Cl.³ A01K 5/00; E04H 17/18
U.S. Cl. 119—60 3 Claims



1. A feed and animal enclosure comprising,

a plurality of pivotally interconnected sections,

each pair of interconnected sections including vertically aligned sleeves on adjacent section ends,

a pin received in said aligned sleeves,

said pin including an end portion extended generally horizontally between said section ends,

said sleeves and section ends being of a size and position relative to one another such that two adjacent sections may pivot towards each other in a direction away from said pin end portion to positions wherein the included angle between said adjacent sections is less than 90° and wherein abutment of said section ends with one another limits further pivotal movement towards each other, and

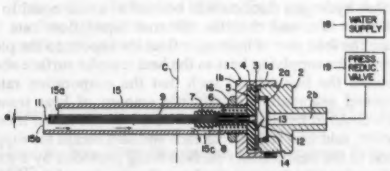
said pin end portion being of a size to limit pivotal movement of said two adjacent sections in a direction towards said pin end portion to positions wherein the included angle between said adjacent sections is obtuse and wherein abutment of said section ends with said pin end portion limits further pivotal movement towards each other whereby said interconnected sections, when pivoted in one direction, abut against each other and, when pivoted in the opposite direction, abut the adjacent pin end portion.

4,346,672

WATER DISPENSER FOR SMALL ANIMALS

Motohiro Niki, 22-11, Yushima 2-Chome, Bunkyo-Ku, Tokyo-To, Japan

Filed Jan. 30, 1981, Ser. No. 230,131
Int. Cl.³ A01K 7/00
U.S. Cl. 119—72.5 4 Claims



1. A water dispenser for feeding small animals having upstream and downstream directions and comprising: a water feed tube having an upstream end through which water flows into the tube and a downstream end through which water

flows out; a control valve interposed between the upstream end of the feed tube and a source of water and closing normally to prevent water from flowing into the feed tube, said valve having means to open it in response to inclination of the feed tube caused by a nudging force applied by a small animal to the downstream end of said tube; and a flow control member inserted in the feed tube to prevent excessive rushing of water therethrough, said flow control member being a bar having a cross sectional shape and size such as to define a passageway for water of capillary cross-sectional dimensions between said member and the inner wall surface of the feed tube.

4,346,673

APPARATUS AND METHOD FOR METERING AND CONTROLLING A FEED OF HYDROGEN FLUORIDE VAPOR

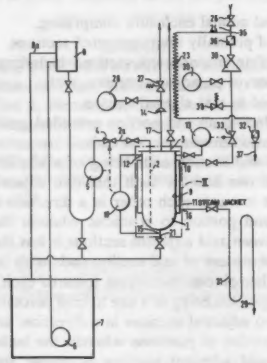
George M. Gillies, St. Annes, England, assignor to British Nuclear Fuels Limited, Warrington, England

Filed Jul. 14, 1980, Ser. No. 168,011

Claims priority, application United Kingdom, Jul. 23, 1979, 7925564

Int. Cl.³ F22B *1/02*

U.S. Cl. 122—31 R **4 Claims**



1. Apparatus for metering and controlling a feed of hydrogen fluoride vapour to a chemical plant, said apparatus comprising a boiler for vaporising substantially anhydrous liquid hydrogen fluoride, having an inlet for the liquid hydrogen fluoride and an outlet for hydrogen fluoride vapour, a feed line including a control valve and a flow meter for the liquid hydrogen fluoride for connecting a source of substantially anhydrous liquid hydrogen fluoride with the boiler inlet, a heat transfer surface within the boiler arranged to be increasingly covered by the liquid hydrogen fluoride as the level of the liquid hydrogen fluoride rises in the boiler and having dimensions related to the flow rate of liquid hydrogen fluoride so that for any given liquid flow rate within predetermined limits a liquid level will be automatically established at which heat transfer through the liquid-covered heat transfer surface is such that hydrogen fluoride will boil off at a rate equal to the liquid flow rate, and thus the metered liquid flow rate will indicate the feed rate of hydrogen fluoride vapour to the plant, and means for supplying heat to the heat transfer surface above and below the liquid level such that the evaporation rate is determined essentially only by the amount of heat transfer surface covered by the liquid, and hence by the liquid level in the boiler, said heat transfer surface and said means for supplying heat to the heat transfer surface being provided by a steam jacket, and means for varying laterally the size of the heated steam jacket to vary the liquid flow limits that can be handled by the apparatus.

3. A method of producing a metered feed of hydrogen fluoride vapour utilizing apparatus comprising a boiler for vaporising substantially anhydrous liquid hydrogen fluoride, having an inlet for the liquid hydrogen fluoride and an outlet for hydrogen fluoride vapour, a feed line including a control valve and a flow meter for the liquid hydrogen fluoride for connecting a source of substantially anhydrous liquid hydrogen fluoride with the boiler inlet, a heat transfer surface within the boiler arranged to be increasingly covered by the liquid hydrogen fluoride as the level of the liquid hydrogen fluoride rises in the boiler and having dimensions related to the flow rate of liquid hydrogen fluoride so that for any given liquid flow rate within predetermined limits a liquid level will be automatically established at which heat transfer through the liquid-covered heat transfer surface is such that hydrogen fluoride will boil off at a rate equal to the liquid flow rate, and thus the metered liquid flow rate will indicate the feed rate of hydrogen fluoride vapour to the plant, and means for supplying heat to the heat transfer surface above and below the liquid level such that the evaporation rate is determined essentially only by the amount of heat transfer surface covered by the liquid, and hence by the liquid level in the boiler, said heat transfer surface and said means for supplying heat to the heat transfer surface being provided by a steam jacket and means for varying laterally the size of the heated steam jacket to vary the liquid flow limits that can be handled by the apparatus, said method comprising metering a feed of liquid hydrogen fluoride, introducing the metered feed into the boiler, supplying heat to the boiler through the heat transfer surface, and maintaining the size and location of the heat transfer surface such that liquid hydrogen fluoride is maintained in the boiler at a level partially covering said surface and the metered liquid flow rate is balanced in equilibrium by the rate of evaporation of the liquid hydrogen fluoride and any departure from said level will be automatically restored.

4,346,674

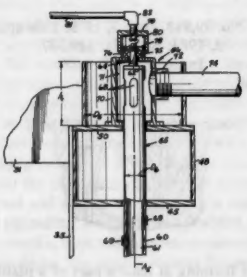
ECONOMIZER WITH SOOT BLOWER

John H. Merritt, Jr., Atlanta, Ga., assignor to Applied Engineering, Inc., Orangeburg, S.C.

Filed Feb. 18, 1981, Ser. No. 235,667

Int. Cl.³ F22B *37/52*

U.S. Cl. 122—390 **4 Claims**



1. An economizer construction for use in recovering heat from flue gases passing upwardly through a vertical stack via a heat transfer fluid and adapted to be cleaned with a pressurized fluid and lubricated with a lubricant comprising:

a housing defining a generally vertically extending flue gas passage therethrough about a generally vertical central axis;

a helically wound heat transfer coil positioned in said flue gas passage for placing the heat transfer fluid in a heat exchange relation with the flue gases passing through said flue gas passage, said heat transfer coil defining a generally vertically extending opening centrally therethrough concentrically of said central axis and having a first prescribed diameter; and

a soot blower assembly including an elongate soot blower

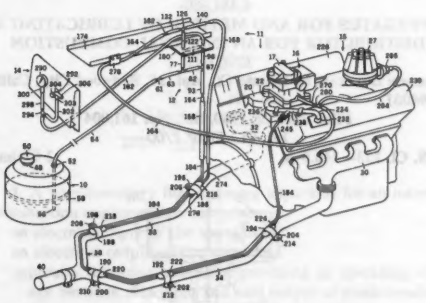
lance having an outside diameter smaller than said first prescribed diameter of said central opening through said heat transfer coil, mounting means for rotatably positioning said soot blower lance within said central opening through said coil so that the longitudinal axis of said lance is generally coaxially oriented along said central axis, drive means for selectively rotating said lance about said central axis, and fluid supply means for supplying the pressurized cleaning fluid to said lance, said lance defining a fluid passage therein in communication with said fluid supply means and defining a plurality of orifices therein for directing streams of the pressurized cleaning fluid from within said fluid passage across said central opening and onto said heat transfer coil to clean same and said mounting means including a lubricable bearing attached to the upper end of said lance so that said lance is rotatably supported in said central opening in said heat transfer coil, a bearing housing mounting said bearing and defining a lubricant chamber therein about said bearing, deflector means for deflecting the flue gases flowing through flue gas passage away from said bearing housing, pipe means communicating with said lubricant chamber and extending exteriorly of said economizer housing across said flue gas passage in said housing, and a grease fitting closing that end of said pipe means extending exteriorly of said housing so that when said lubricant chamber and said pipe means are filled with the lubricant, the flue gases flowing around said pipe means heats the lubricant therein to generate a pressure in said pipe means to force the lubricant into said lubricant chamber and against said bearing to keep said bearing lubricated.

4,346,675

STEAM INJECTION SYSTEM FOR ENGINES

John T. Holliday, Jr., 308 Strawbridge Dr., Chesterfield, Mo. 63017

Filed Aug. 30, 1980, Ser. No. 164,134
Int. Cl.³ F02D *19/00*
U.S. Cl. 123—25 P **27 Claims**



1. A system of injecting steam into the fuel-air flow of an internal combustion engine having at least one cylinder, said engine having a carburetor with a throttle plate and a fuel flow path from the carburetor to the engine cylinder; a means of producing heat; a water source present; said system comprising:

(a) a first conduit for connection to the water source and extending to association with the means for heating so that water flowing through the first conduit is converted to steam, said first conduit thence extending for connection with the fuel flow path so that steam from the first conduit can be injected in said fuel flow path at a point between the throttle plate and the engine cylinder;

(b) a second conduit for connection to the atmosphere and for connection to said fuel flow path at a point above the throttle plate;

(c) a third conduit for connecting the second conduit to the first conduit at a point in the first conduit between the water source and the heating means to allow fluid flow between the first and second conduits;

(d) a fourth conduit for connecting the third conduit to the first conduit at a point in the first conduit between the association of the first conduit with the heating means and the connection of the first conduit with the third conduit; and

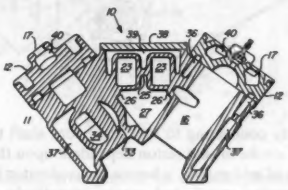
(e) means for controlling fluid flow through the conduits.

4,346,676

TWO-CYCLE V-ENGINE WITH INTEGRALLY CAST EXHAUST MANIFOLD

Alfred E. Tyner, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Aug. 6, 1979, Ser. No. 64,120
Int. Cl.³ F01P *3/02, 3/12*
U.S. Cl. 123—41.74 **1 Claim**



1. A unitary cast cylinder block for a water cooled, two-cycle crankcase compression outboard motor engine, said unitary block comprising:

A. a plurality of cylinders arranged in first and second vertical banks, said banks forming a V having an included angle of approximately 74°, each of said cylinders including an inlet port means for transferring inlet gases from a crankcase to the interior of said cylinders;

B. first and second vertical exhaust gas chambers between said cylinder heads, said exhaust gas chambers opening downwardly;

C. exhaust gas passages connecting each of said cylinders of said first and second banks with said first and second exhaust gas chambers, respectively;

D. walls between said exhaust gas chambers and said cylinders to define a vertically extending central core cooling passage;

E. first and second upper cylinder cooling jackets surrounding said cylinders at their head ends;

F. a manifold cooling passage partially defined between said first exhaust gas chamber and said first upper cylinder cooling jacket and between said second exhaust gas chamber and said second upper cylinder cooling jacket, said manifold cooling passages extending along the full length of said exhaust gas chambers; and

G. first and second walls on the outside of said first and second cylinder banks, respectively, said walls spaced from said cylinders to define first and second outside cooling chambers on the outside of said V, said outside cooling chambers located near the apex of said V.

4,346,677

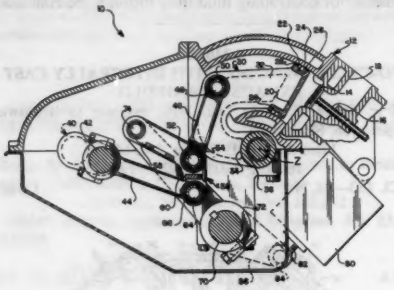
COMBUSTION ENGINE WITH SUBSTANTIALLY CONSTANT COMPRESSION

Norman H. Nye, 1348 Highbridge Rd., Cuyahoga Falls, Ohio 44223

Filed Sep. 2, 1980, Ser. No. 183,251
Int. Cl.³ F02B *75/26*
U.S. Cl. 123—54 B **6 Claims**

1. In an internal combustion engine, a crankshaft having a fixed rotary axis, a connecting rod engaging said crankshaft, an

engine block means including an arcuately shaped cylinder, valve and combustion material supply means connected to said cylinder, a piston positioned in said cylinder for reciprocation therein, a piston rod positioning said piston, a regulatory shaft positioned parallel to said crankshaft on a second fixed rotary axis, a mounting shaft for said piston rod, and link means pivotally interconnecting said piston rod to said connecting rod and



operatively connecting to said regulatory shaft to control the length of stroke of said piston dependent upon the operational condition of said engine, wherein an accelerator is provided to control engine speed, and means operatively connect said regulatory shaft to the accelerator controlling the engine to move said regulatory shaft arcuately with changes in the setting of said accelerator and reduce the length of piston stroke with less fuel supply to the engine.

4,346,678

ROCKER ARM AND METHOD OF MAKING SAME

Joseph L. Wherry, Perrysburg, Ohio, assignor to Toledo Stamping & Manufacturing Company, Toledo, Ohio

Filed Mar. 27, 1980, Ser. No. 134,447
Int. Cl.³ F01L *1/18*
U.S. Cl. 123—90.44 **7 Claims**

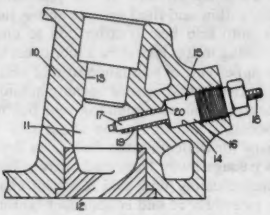
1. A stamped rocker arm of the cam-follower type comprising an upper metal strip and a lower metal piece, a surface of said metal strip being substantially contiguous with part of said metal piece, said metal piece having a rounded recess in an end portion thereof facing away from said metal strip to receive a lifter post having an end on which said rocker arm can pivot, said metal piece having a hole therein communicating with said rounded recess, said metal piece also having an additional recess at another end portion thereof to receive an end of a valve stem, said metal strip having an intermediate convex portion facing away from said metal piece to be engaged by a cam, and said strip having a slot communicating with said hole and extending at least to said convex portion thereof and forming a lubricant groove with a portion of said part of said metal piece, said groove communicating with said hole and extending at least to said convex portion of said strip, and means affixing said strip to said piece.

4,346,679

STARTING AIDS FOR INTERNAL COMBUSTION ENGINES

Richard P. Knowles, Farnborough, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jan. 9, 1980, Ser. No. 110,629
Claims priority, application United Kingdom, Feb. 1, 1979, 7903601
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—145 A **5 Claims**



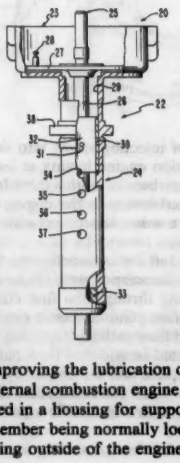
1. A starting aid for an internal combustion engine comprising a body, a tubular extension located at one end of the body, said extension having a diameter of a size such that a shoulder is formed between the body and the extension, a wound heating element located within the end of the tubular extension, said heating element in use, being heated by the passage of electric current to provide a heated surface, a sleeve mounted about said extension, said sleeve being in heat exchange relationship with the surface of the portion of the extension about which it is located, the sleeve extending from said shoulder to a position spaced from the end of the extension, the sleeve being formed from a material having a high thermal conductivity.

4,346,680

APPARATUS FOR AND METHOD OF LUBRICATING A DISTRIBUTOR FOR AN INTERNAL COMBUSTION ENGINE

Zenovie Boychuk, 86 Renato Ct., Apt. 14, Redwood City, Calif. 94061

Filed Jun. 19, 1980, Ser. No. 161,004
Int. Cl.³ F02P *1/00*
U.S. Cl. 123—146.5 A **2 Claims**



1. A method of improving the lubrication of a conventional distributor for an internal combustion engine having an upper bearing means located in a housing for supporting a rotatable shaft, said bearing member being normally located in an upper portion of said housing outside of the engine crankcase com-

partment into which said distributor is inserted, comprising the steps of:

locating said upper bearing means in said housing so that at least a lower part thereof extends into said engine crankcase compartment into which said distributor is inserted; and

providing a hole in said housing removed from said upper bearing means for admitting oil splashed on said housing due to rotation of a crankshaft to contact said shaft and migrates to said upper bearing means to lubricate said upper bearing means as said shaft rotates.

4,346,681

APPARATUS FOR FUEL METERING, AND IN PARTICULAR, SUPPLEMENTARY FUEL METERING, BY MEANS OF A SPECIAL METERING DEVICE IN AN EXTERNALLY IGNITED INTERNAL COMBUSTION ENGINE

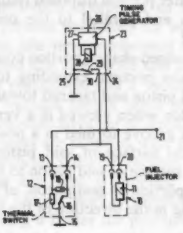
Rolf Schleicher, Leinfelden; Lutz Seebald, Möglingen, and Walter Seitz, Filderstadt, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 9, 1979, Ser. No. 93,094

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1978, 2848563

Int. Cl.³ F02B *3/00*; F02N *17/08*

U.S. Cl. 123—179 L **11 Claims**



1. A supplementary fuel metering apparatus for an internal combustion engine which comprises:

an electrical input of the apparatus;

an electrical output of the apparatus;

apparatus actuating means for providing an operating voltage between said input and said output at predetermined times and operating conditions of the engine;

a voltage-actuated fuel metering device;

a timing pulse generator which includes

pulse transducer means, connected between said input and said output and actuated by the operating voltage, for generating electrical pulses, and

switch means, actuated by the electrical pulses generated by the pulse transducer means, for periodically connecting the fuel metering device between said input and said output; and

thermal time switch means for connecting the fuel metering device across said input and said output for at least an initial portion of each time period that the operating voltage is provided between said input and said output, whenever a sensed temperature is below a predetermined temperature value at the beginning of said time period.

4,346,682

CARBURETOR FOR A MULTICYLINDER INTERNAL COMBUSTION ENGINE AND METHOD OF OPERATION THEREOF

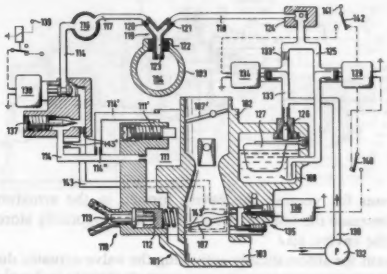
Reinhard Mader, Reisgang, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke, Munich, Fed. Rep. of Germany

Filed Feb. 28, 1980, Ser. No. 125,664

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1979, 2907812

Int. Cl.³ F02M *23/04*

U.S. Cl. 123—179 G **25 Claims**



3. A carburetion arrangement for a multicylinder internal combustion engine, the arrangement comprising at least one carburetor for forming a main fuel-air mixture, individual intake channel means for connecting the at least one carburetor to intake valves of the internal combustion engine, and separate air line means and fuel line means for respectively delivering air and fuel to the intake channel means, characterized in that control means, controlled as a function of volume, are provided for commonly distributing intake air for fuel-air mixture components formed by the separate air line means and fuel line means to the individual intake channel means, at least one additional control means is provided for controlling a small portion of the intake air, said additional control means is operable to control the intake air to the separate air line means as a fuel correction and as a function of volume with a volume of the fuel correction air being reduceable to zero, said additional control means is disposed upstream of an air distributor means for distributing air to the separate air lines means, and in that fuel distributor means are provided for distributing fuel to the separate fuel line means, said fuel distributor means are connected at zero pressure to the at least one carburetor means.

4,346,683

AUTOMATIC STARTING FLUID INJECTION APPARATUS

James W. Burke, Rte. 2, Box 476, Long Grove, Ill. 60047

Continuation-in-part of Ser. No. 926,413, Jul. 20, 1978, Pat. No. 4,202,309. This application Feb. 21, 1980, Ser. No. 123,486

The portion of the term of this patent subsequent to May 13, 1997, has been disclaimed.

Int. Cl.³ F02M *1/16*

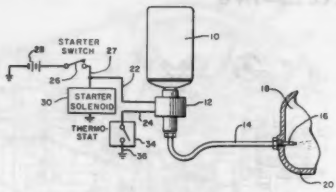
U.S. Cl. 123—180 R **21 Claims**

1. An apparatus for automatically injecting a pressurized starting fluid from a valved cannister into an air intake passage of an internal combustion engine provided with starter means, said apparatus comprising:

a valve actuator having an intake bore coupled to the valved cannister and an exit bore, said valve actuator, when activated, operating to pass starting fluid continuously from the valved cannister, through the intake bore, to the exit bore, said actuator including a coil and a movable armature disposed adjacent the coil to actuate the cannister valve when electrical current is passed through the coil;

means for conducting starting fluid from the exit bore of the valve actuator to the air intake passage;

reservoir means in fluid communication with the exit bore for temporarily storing a volume of starting fluid during the period when the valve actuator is activated, and for supplying the volume of starting fluid to the air intake passage immediately following de-activation of the valve actuator, said reservoir means including a cavity formed in the armature;



means for venting the cavity formed in the armature to increase the volume of starting fluid temporarily stored in the cavity; and

means for automatically activating the valve actuator during operation of the starter means, such that the valve actuator is automatically controlled to cause starting fluid to be injected into the air intake passage during and immediately following operation of the starter means.

4,346,684

VALVE SEAT RING

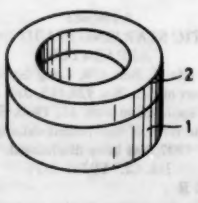
Paul Vossieck, Burscheid, Fed. Rep. of Germany, assignor to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Apr. 30, 1980, Ser. No. 145,762

Claims priority, application Fed. Rep. of Germany, May 5, 1979, 2918248

Int. Cl.³ F01L *3/02*

U.S. Cl. 123—188 S **10 Claims**



1. In a sintered valve seat ring including an annular supporting portion and an annular facing portion superposed on the supporting portion; said supporting portion comprising a material selected from the group consisting of an iron alloy and a steel alloy and said facing portion comprising a material selected from the group consisting of a nickel alloy, a cobalt alloy and a nickel-cobalt alloy; the improvement wherein said supporting portion additionally comprises, distributed therein, up to 30% by weight of the alloy selected for said facing portion.

4,346,685

INTERNAL COMBUSTION ENGINE WITH GAS SEALING DEVICE

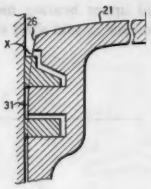
Tetsuzo Fujikawa, Kobe, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Filed Jan. 8, 1980, Ser. No. 110,301

Claims priority, application Japan, Jan. 23, 1979, 54-7317[U]

Int. Cl.³ F02F *3/24*; F16J *9/02, 9/08*

U.S. Cl. 123—193 P **1 Claim**



1. An internal combustion engine comprising

a cylinder,

a piston for reciprocating movement arranged in said cylinder,

a combustion chamber defined by a top surface of said piston and an inner surface of said cylinder,

a device for providing a gas seal between an outer circumferential surface of said piston and said inner surface of said cylinder, which comprises,

a piston ring, and

a piston ring groove formed in said outer circumferential surface of said piston for fitting said piston ring therein, in which

said piston ring groove is in the shape of an L-shaped keystone, including

an annular outer portion disposed radially outwardly of said piston and parallel to the center axis of said piston, and

an annular wedged-shaped portion contiguous with said annular outer portion, extending toward the center axis of said piston and tapered toward the center axis of said piston when viewed in a vertical section,

said piston ring groove formed in a position in the outer circumferential surface of said piston that is remote from the top surface of said piston to form a top land in a peripheral portion of said piston, of substantial thickness extending in the direction of the center axis of said piston,

said piston ring is in the shape of an L-shaped keystone, including

an annular outer ring portion disposed in said outer groove portion of said piston ring groove, extending parallel to the center axis of said piston, and

an annular wedge-shaped ring portion disposed in said wedge-shaped groove portion of said piston ring groove, tapering toward the center of axis of said piston when viewed in a vertical section, said annular wedge-shaped ring portion maintained in sliding contact at its outer circumferential surface with the inner surface of said cylinder,

with a gap defined between said L-shaped keystone piston ring and said L-shaped keystone piston ring groove, in which said top land has a diameter smaller than a diameter of a bottom land formed on the outer circumferential surface of said piston on a side of said piston ring groove opposite said top land, forming a gap between an outer circumferential surface of said top land and the inner surface of said cylinder, the diameter of said top land gradually expanding in the direction toward said piston ring groove away from said combustion chamber, said top land partially overlying said piston ring, and the outer circumferential surface of said top land curves inwardly from a maximum diameter at the edge of said piston ring

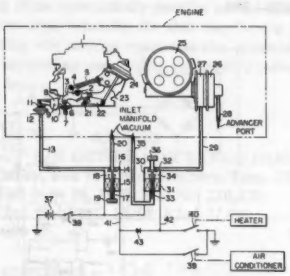
groove toward the center axis of said piston in the direction toward said combustion chamber away from said piston ring groove, to allow gas pressure to be introduced from said combustion chamber into the gap defined between said L-shaped keystone piston ring and said L-shaped keystone piston ring groove.

4,346,686

IDLE CONTROLLER FOR AN INTERNAL COMBUSTION ENGINE

Nobuaki Wakita, and Hiroshi Kanai, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 919,172, Jun. 26, 1978, abandoned.
This application May 5, 1980, Ser. No. 146,440
Claims priority, application Japan, Feb. 17, 1978, 53-17179
Int. Cl.³ F02M 3/06; F02P 5/10
U.S. Cl. 123—339 3 Claims



1. In a vehicle which comprises an internal combustion engine having a throttle positioner for selectively setting the engine's minimum idle rate, mechanical means for automatically increasing said idle rate above said minimum in response to certain engine conditions, and a vacuum advancer having first and second vacuum supply ports and being adapted to provide normal vacuum advance of ignition timing when said first and second ports are supplied with engine inlet manifold vacuum and to provide reduced vacuum advance of ignition timing when said first port is supplied with inlet manifold vacuum and said second port is supplied with atmospheric pressure, and having a heater for providing engine-generated heat to the vehicle during operation and an air conditioner adapted to be driven by the engine, a control system, comprising:

(a) first means for controlling said throttle positioner to automatically increase said minimum idle rate setting between a low setting and a high setting;

(b) second means for indicating operational condition of said heater;

(c) third means for controlling alternative supply of said manifold vacuum and atmospheric pressure to said second port of said vacuum advancer;

(d) fourth means for indicating operational condition of said air conditioner;

(e) said second and fourth means controlling said first means to maintain said minimum idle rate of said low setting when neither said heater nor said air conditioner is operating and to increase said minimum idle rate to said high setting when either said heater or said air conditioner is operating; and

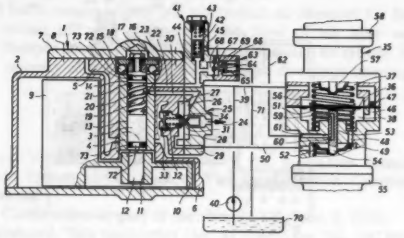
(f) said second means controlling said third means so as to supply atmospheric pressure to the second port of said vacuum advancer when said heater is operating and so as to supply said manifold vacuum to said second port during operating conditions of the engine when said heater is not operating.

4,346,687

FUEL INJECTION SYSTEMS

Armin Bauder, Neckarsulm, Fed. Rep. of Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm, Fed. Rep. of Germany

Filed Jun. 5, 1980, Ser. No. 156,743
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1979, 2927110
Int. Cl.³ F02M 69/00
U.S. Cl. 123—454 7 Claims

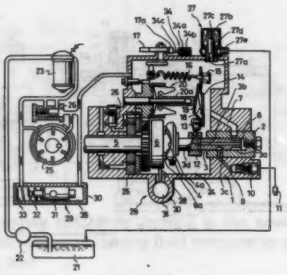


1. In a fuel injecting system for a mixture compressing spark-ignition internal combustion engine with continuous fuel injection, having a valve for maintaining a predetermined pressure in the system; means for metering air flowing through the intake manifold of the engine; a fuel proportioning valve, actuable by the air metering means, for proportioning fuel at a pressure difference which is constant but which can be varied by running parameters of the engine, the fuel proportioning valve comprising a rotatable piston valve, a piston valve cylinder, a pair of axially spaced cylindrical bearings for mounting the piston valve in the cylinder to define a space between the valve and the cylinder extending between the bearing; a fuel feed line for introducing fuel under pressure in to said space such that a lower pressure prevails outside at least one bearing; a fuel return line, a differential pressure regulating valve for regulating said pressure difference, comprising body means defining a substantially enclosed space, a diaphragm constituting a movable valve member and extending across the space to define first and second chambers, valve means for connecting the first chamber to the return line, the valve means being operable by the diaphragm, and means for connecting the second chamber to the fuel feed line upstream of the fuel proportioning valve; and a diaphragm valve having a casing defining a substantially enclosed spaced having a valve seat; a diaphragm extending across the space to define two chamber, and acting as a movable valve element for closing the valve seat, the diaphragm being held in the casing between two flat surfaces of the casing, means for connecting the first chamber to the fuel proportioning valve downstream of the fuel proportioning valve, means for connection the first chamber to an injection valve via the valve seat, and means for connecting the second chamber of the diaphragm valve to the first chamber of the differential pressure regulating valve; the improvement comprising one of the piston valve or cylinder defining an annular groove at least one of the bearings and sealing gasket means disposed in the groove to seal against the other of the valve or cylinder; a normally closed stop valve disposed in the return pipe and means for holding the stop valve open when the second chamber of the differential pressure regulating valve is above a predetermined a level; the system pressure valve having an outlet connected to the return pipe upstream of the stop valve; and the diaphragm valve having a spring and means for mounting the spring between the casing and the diaphragm such that the spring acts on the diaphragm to close the valve seat.

4,346,688
INJECTION TIMING CONTROL SYSTEM FOR FUEL INJECTION PUMP

Nobuhiro Kaibara, and Kazuyoshi Takaichi, both of Higashi-Matsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Nov. 20, 1979, Ser. No. 96,062
Claims priority, application Japan, Feb. 19, 1979, 54-18137
Int. Cl.³ F02M *39/00*
U.S. Cl. 123—502 11 Claims



1. An injection timing control system in combination with a fuel injection pump for an internal combustion engine, the pump being of the type including a housing having a fuel chamber defined therein, fuel supply means for supplying fuel to said fuel chamber under pressure dependent upon engine r.p.m., and fuel injection quantity control means having an operating member operatively connected thereto and displaceable to cause a change in the fuel injection quantity of the pump, said injection timing control system being actuatable in response to pressure within said fuel chamber and comprising:

a. a magnet valve arranged to perform a periodic valve opening and closing action for control of the pressure within said fuel chamber;

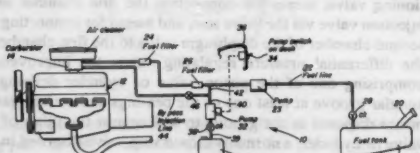
b. detecting means for electrically detecting an acceleration of said operating member and to generate an acceleration rate signal representing the rate of said acceleration of said operating member; and

c. control means for processing said acceleration rate signal to supply a control pulse signal which is a function of said acceleration rate signal to said magnet valve to drive same.

4,346,689
CONTROLLED FUEL INJECTION SYSTEM

Noah A. Neely, 9180 E. Placita Violeta, Tucson, Ark.IZONA 85715

Filed Dec. 9, 1980, Ser. No. 214,869
Int. Cl.³ F02B *13/00, 77/04*
U.S. Cl. 123—575 8 Claims



1. A controlled fuel injection system comprising:

a fuel-supplied combustion engine means including a fuel supply storage tank and a fuel line operably connected between said tank and said engine means for delivering said fuel to said engine means;

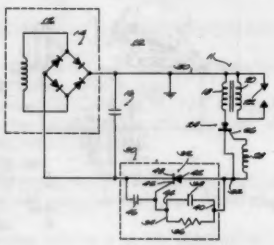
an additive supply means including an additive supply storage tank and an additive supply line connected between the additive supply storage tank and fuel line for selectively delivering an additive to said engine means; and

bypass means including a bypass injection line connected with the engine means and operatively connected with the fuel line and additive line downstream of the storage tanks for selectively delivering said fuel and said additive to said engine means in the event that a portion of said fuel line, downstream of the additive supply line becomes inoperative.

4,346,690
CD IGNITION WITH ISOLATION CIRCUIT TO PROVIDE IMMEDIATE RECHARGING OF THE CHARGE CAPACITOR

Philip A. Anderson, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 9, 1980, Ser. No. 157,418
Int. Cl.³ F02P *3/06*
U.S. Cl. 123—599 12 Claims



1. An isolation circuit adapted for use with a capacitor discharge ignition system including a charge capacitor, an ignition coil primary winding, and an ignition SCR, said isolation circuit comprising a thyristor having a gate, an anode and a cathode, said thyristor having an anode-cathode path adapted for connection in series relationship with the charge capacitor, the primary winding and the ignition SCR, said isolation circuit further comprising a parallel RC network having one end connected to said thyristor anode and having an opposite end connected to said thyristor gate, said isolation circuit providing for immediate recharging of the charge capacitor after the charge capacitor has discharged through the primary winding to effect an ignition spark.

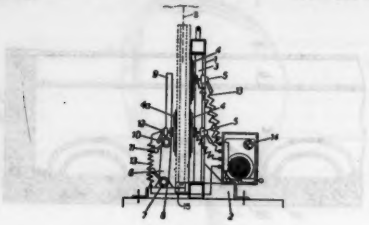
4,346,691
SLAB-GRIPPING APPARATUS

Patrick T. Bourke, Doon House, Maam, County Galway, Ireland

Division of Ser. No. 848,352, Nov. 3, 1977, which is a continuation-in-part of Ser. No. 686,213, May 12, 1976, Pat. No. 4,063,982, which is a continuation-in-part of Ser. No. 394,138, Sep. 4, 1973, Pat. No. 3,963,846. This application Aug. 7, 1979, Ser. No. 64,999
Int. Cl.³ B28D *1/02*
U.S. Cl. 125—12 8 Claims

1. In combination with a stone-cutting saw, slab-gripping apparatus comprising first gripping means in the form of at least one vacuum-operated suction cup, an upright frame on which said cup is mounted in a substantially vertical position, second gripping means in the form of at least a second vacuum-operated suction cup disposed in opposed relation to said first suction cup, means for supporting a stone slab on its edge between said cups with one face of the slab in contact with said first gripping means and the lower edge of the slab supported on said supporting means, articulated support means for said second suction cup whereby the cup may be swung into a position in which it is in contact with the opposite face of the

slab, and means for supplying suction to each of the cups such that said first cup is adapted to grip one face of the slab while the second suction cup is adapted to grip the opposite face of the slab, the saw and slab-gripping apparatus being so positioned relative to each other that the blade of the saw cuts



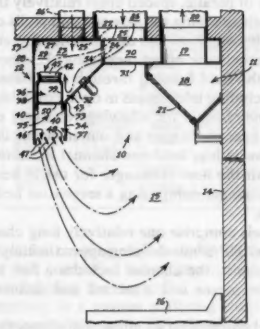
along a cutting plane substantially parallel to and between the opposed suction cups, whereby the slab may be cut into two layers and during the cutting operation the opposed suction cups and said supporting means prevent relative movement of the partly-cut layers.

4,346,692

MAKE-UP AIR DEVICE FOR RANGE HOOD

Lewis C. McCauley, Box 895, Murfreesboro, Tenn. 37130

Filed Nov. 26, 1980, Ser. No. 210,270
Int. Cl.³ F21C *15/08*; F24J *11/00*
U.S. Cl. 126—299 D **7 Claims**



1. A make-up air device for use in combination with an overhead exhaust hood above a cooking range, comprising:

(a) a supply air plenum adapted to be mounted above the front portion of a cooking range,

(b) said plenum having a lower portion, including a front wall,

(c) a supply air inlet communicating with the interior of said supply air plenum,

(d) said lower portion comprising a lower wall terminating in a lower edge portion spaced from said front wall to define an air outlet passage,

(e) a controlled air chamber extending vertically through said outlet passage,

(f) said controlled air chamber comprising an upright rear wall projecting above said lower edge portion of said lower wall to form an air pocket in the lower portion of said plenum behind said upright rear wall,

(g) said controlled air chamber comprising an inlet portion above said lower edge portion of said lower wall, and communicating with said plenum, whereby air within said supply air plenum is spread out by said air pocket before the air discharges through said inlet portion,

(h) damper means having variable size cpenings in said inlet portion,

(i) means for controlling said damper means to vary the size of said openings in order to vary the volume of air flowing through said inlet portion into said controlled air chamber,

(j) said controlled air chamber having a discharge opening through which air from said chamber is discharged above the cooking range,

(k) variably movable louvers mounted in said discharge opening for directing and changing the flow of air through said discharge opening, and

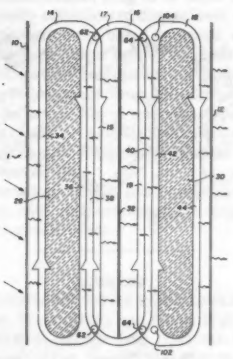
(l) baffle means within said controlled air chamber for flattening out and dampening the flow of air from said damper means to said discharge opening to reduce the velocity of the air flow through said discharge opening.

4,346,693

SOLAR PANEL

Gerard Wagner, 1202-2075 Commox St., and Klaus Schmid, 1365 Laburnum St., both of Vancouver, British Columbia, Canada

Continuation-in-part of Ser. No. 91,325, Nov. 5, 1979, abandoned. This application Oct. 31, 1980, Ser. No. 202,845
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—434 **10 Claims**



1. A solar panel, comprising:

an interior heat storage means;

a solar radiation collector wall mounted proximate a first part of said heat storage means having a collector surface for exposure to solar radiation;

a heat emitter wall mounted proximate a second part of said heat storage means opposite the first part thereof having an emitter surface for exposure to a space to be heated;

a collector fluid conducting path for directing a collector fluid around an endless loop from a primary portion of the loop wherein there is heat exchanging contact with said solar radiation collector wall to a secondary portion of the loop wherein there is heat exchanging contact with an emitter fluid and the first part of said interior heat storage means,

an emitter fluid conducting path for directing emitter fluid around an endless loop from a primary portion of the loop wherein there is heat exchanging contact with the collector fluid and the second part of said interior heat storage means to a secondary portion of the loop wherein there is heat exchanging contact with said emitter wall;

an heat exchanger panel located within said interior heat storage means having an outer surface which is in thermally conductive association with the collector fluid in the secondary portion of said collector fluid path and an inner surface which is in thermally conductive association

with the emitter fluid in the primary portion of the emitter path;

a pair of insulation panels one between the primary and secondary portions of the collector fluid conducting path and the other between primary and secondary portions of the emitter conducting fluid path;

wherein said collector and emitter walls each are made of a heat conducting sheet material, and

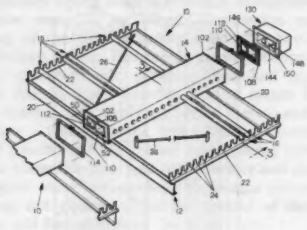
wherein said interior heat storage means further includes a storage fluid conducting path for directing a storage fluid around an endless loop from the secondary portion of the collector fluid path wherein there is heat exchanging association with the collector fluid to the primary portion of the emitter fluid path wherein there is heat exchanging association with the emitter fluid.

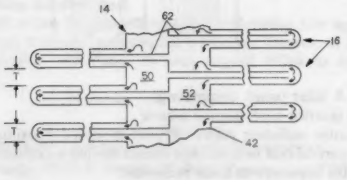
4,346,694

SOLAR COLLECTOR MODULE

Kenneth L. Moan, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 17, 1981, Ser. No. 235,076
Int. Cl.³ F24J 3/02; F28D 7/12
U.S. Cl. 126—443 **7 Claims**





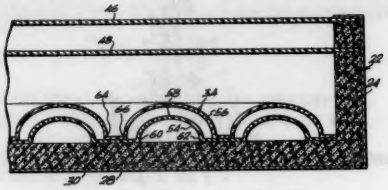
1. A solar collector module comprising, in combination, a manifold having an outer sheath, an inner sheath, a layer of insulating material disposed between said sheaths, a baffle disposed within said inner sheath and defining two passageways, and flange means for connecting said manifold to associated devices, a plurality of evacuated tube collector assemblies, each assembly comprising an elongate collector element having an inner wall and an outer wall, and an elongate hollow member disposed therein and defining an inner passageway within said member and an outer passageway between said member and said inner wall of said collector element, said inner passageway of each of said assemblies communicating with one of said two manifold passageways and the outer passageway of said each of said assemblies communicating with the other of said two manifold passageways, and a gasket disposed generally between said collector elements and said manifold sheaths and insulating material, said collector elements arranged in a staggered coplanar array on opposed sides of said manifold.

4,346,695

SOLAR HEAT EXCHANGER

George Kitzmiller, 721 E. 5 St., Miami, Fla. 33010

Filed Feb. 14, 1980, Ser. No. 121,521
Int. Cl.³ F24J 3/02
U.S. Cl. 126—444 **10 Claims**



1. A solar heat exchanger comprising:

a frame including a bottom, first and second ends, and upstanding side walls defining an inner surface area, an insulation layer of approximately uniform thickness throughout the inner surface area,

a plurality of channels arranged throughout the frame resting upon the insulation material,

each channel having inner and outer walls wherein fluid flows in a restricted manner between the walls through the channel, the inner wall spaced a predetermined distance from the insulation layer defining an insulation space,

solar heat trapping means comprising:

a plurality of parallel spaced apart relatively thin transparent panels spanning the side and end walls of the frame, for minimizing heat loss due to reflection and for creating a greenhouse effect increasing the amount of heating on the fluid flowing through the channels, and

the frame including inlet means in open communication with at least one channel for allowing relatively cool fluid to enter the heat exchanger and outlet means in open communication with at least one channel for allowing heated fluid to exit the heat exchanger for use in heating;

said heat exchanger comprising a serpentine heat exchanger as follows:

the channels comprise one relatively long channel having multiple 180° bends defining approximately equal channel segments, the channel includes a first end defining an outlet means and a second end defining an outlet means;

each channel comprising an ellipsodial shape, the inner wall being of an ellipsodial curvature and the outer wall being of an ellipsodial curvature,

the ellipsodial inner wall spaced a predetermined distance from the insulation layer defining an ellipsodial inner insulation space, the outer wall spaced a predetermined distance from the inner wall, the ellipsodial walls defining an ellipsodial channel, wherein a fluid may flow in a restricted manner between the inner and outer walls.

4,346,696

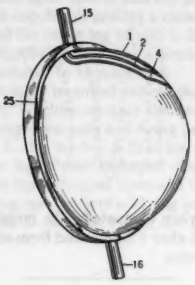
SOLAR ENERGY COLLECTOR

Robert Brunet, Eysines, France, assignor to Brunet France S.A., Eysines, France

Filed Mar. 16, 1979, Ser. No. 21,234
Claims priority, application France, Sep. 27, 1978, 78 28310
Int. Cl.³ F24J 3/02
U.S. Cl. 126—450 **21 Claims**

1. A solar energy collector comprising at least four domes: an outer transparent dome arranged so as to result in a greenhouse effect within said collector, a subdome, an inner dome, and an intermediate dome; each of said domes having a substantially circular base and being nested within one another so as to form said energy collector, each of said domes having a

collar at its base, said collars overlapping when said domes are nested, said collector further comprising a belt arranged above



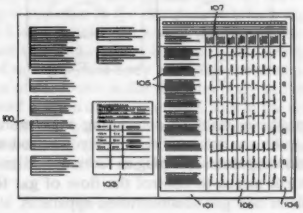
and below said collars so as to absorb stresses to which each of said domes is subjected.

4,346,697

METHOD FOR TREATING DEPRESSION AND OTHER MALADIES BY MEANS OF PATIENT-CREATED SYMPTOM GRAPHS

Kopel H. Cohen, 58 Kettle Creek Rd., Weston, Conn. 06880

Filed Mar. 5, 1979, Ser. No. 17,109
Int. Cl.[3] A61B *19/00*
U.S. Cl. 128—1 R 11 Claims



1. A method for treating patients suffering from depression by means of the controlled administration of antidepressant medication comprising the steps of:

a. administering to a patient suffering from depression an antidepressant drug on a daily basis for a first dosage period set by the practitioner, and in conjunction with the administration of said antidepressant drug during said first dosage period;

b. administering to said patient suffering from depression a patient-completable symptom chart comprising a plurality of symptom fields, each symptom field corresponding to a particular symptom of depression, and

c. said symptom fields being arranged sequentially on said chart, and

d. each of said symptom fields including a series of printed symptom indicatives, with said symptom indicatives each corresponding to a particular degree of a related symptom and said symptom field including symptom indicatives ranging from an extreme manifestation of the symptom, to symptom indicatives indicating improvement in patient condition relative to said extreme symptom, to a positive symptom indicative indicating minimum manifestation of said symptom, and

e. said symptom indicatives being arranged in said symptom field in a progressive sequence with the indicative relating to said extreme manifestation being at one end of said sequence, symptoms indicating improvement in said patient condition following said extreme symptom in said progressive sequence and said positive symptom being located at the other extremity of said progressive sequence, and

f. a patient-markable graph field arranged in association with each of said symptom fields on said patient-completable symptom chart; said graph field including a series of columns with the number of said columns in said graph field being at least equal to the number of days covered by said first dosage period, and

g. each of said columns including zone means for receiving a patient-applied indication, with each of said printed symptom indicatives having a zone means in correspondence therewith in each column of said graph field, and

h. said patient assesses his symptoms during said first dosage period by the step of applying an indication in said zone means which corresponds to the symptom indicative most closely corresponding to said patient's assessment of his symptoms on each treatment date over said first dosage period, said patient thereby creating a graphical representation of said patient's symptoms on said symptom chart; and

i. wherein upon the completion of said first dosage period, on the basis of said practitioner's assessment of the graph created on said symptom chart by said patient during said first dosage period, said practitioner increases the originally administered dosage of antidepressant drug to be taken by said patient or said practitioner maintains said dosage of antidepressant drug to be taken by said patient at said originally administered dosage level, said dosage of said antidepressant drug being increased when said patient-created graph shows no improvement in said symptoms associated with said patient's depression, and said dosage of antidepressant drug being maintained at said originally administered level when the slope of the line on said patient-markable graph field is upward or shows improvement in said symptoms associated with said patient's depression;

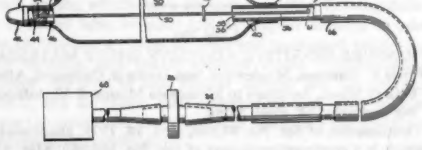
j. the administration of said patient-completable chart in combination with said antidepressant drug providing a positive therapeutic effect.

4,346,698

BALLOON CATHETER WITH ROTATABLE SUPPORT

Bruce L. Hanson, Wayne, N.J., and Sidney Wolvek, Brooklyn, N.Y., assignors to Datascope Corp., Oakland, N.J.

Continuation-in-part of Ser. No. 883,513, Mar. 6, 1978, Pat. No. 4,261,339. This application May 20, 1980, Ser. No. 151,611
Claims priority, application United Kingdom, Sep. 4, 1979, 7912427
The portion of the term of this patent subsequent to Apr. 14, 1998, has been disclaimed.
Int. Cl.[3] A61M *29/02*
U.S. Cl. 128—1 D 9 Claims



1. A catheter comprising an inflatable and deflatable chamber having opposed ends, a catheter tube portion, one end of said chamber connected to said catheter tube portion, an elongated support member extending in said chamber between the opposed ends thereof, one end of said support member disposed at said end of said catheter tube portion and the other end disposed at the other end of the chamber opposed from said one end connected to the catheter tube portion, said sup-

port member supporting said chamber and being rotatably disposed with respect to each end of said chamber, said chamber being adapted to be rotated relative to said catheter tube portion and to be wrapped about said support member.

4,346,699

WATER PROOF CAST PROTECTOR

John D. Little, 25097 Champlain Rd., Laguna Hills, Calif. 92653, and James Z. Cloud, Jr., 1215 S. Athena Way, Anaheim, Calif. 92806

Continuation of Ser. No. 100,987, Dec. 6, 1979, abandoned, which is a continuation of Ser. No. 909,967, May 26, 1978, abandoned, which is a continuation-in-part of Ser. No. 784,496, Apr. 4, 1977, Pat. No. 4,139,003, which is a division of Ser. No. 636,508, Dec. 1, 1975, Pat. No. 4,034,326, which is a continuation of Ser. No. 530,959, Dec. 9, 1974, abandoned. This application Mar. 30, 1981, Ser. No. 248,900

Int. Cl.³ A61F *13/00*

U.S. Cl. 128—82 1 Claim

1. A protective covering to seal a cast or bandage on the individual's arm or leg from water in bathing comprising:

a tubular cast covering portion of flexible, resilient material, having an inside diameter larger than the outside diameter of said cast or bandage;

a closed receptacle portion of flexible, resilient material integral with one end of said cast covering portion, having an inside diameter larger than the outside diameter of said cast or bandage and adapted to enclose the hand or foot of the individual;

a tubular sealing portion of flexible, resilient material having one end integral with the other end of said cast covering portion, the other end of said sealing portion being open, said sealing portion having a substantially uniform diameter substantially less than the diameter of said cast covering portion, said sealing portion being of an extended length sufficient to form a watertight seal around a section of the arm or leg, said arm or leg section being located above the upper termination of said cast and having a diameter which varies considerably along its length; and

a flexible, stretchable rib around said open end of the sealing portion to provide strength to said sealing portion and enhance the watertight seal.

4,346,700

PRESSURE-SENSITIVE ADHESIVE SHEET MATERIAL

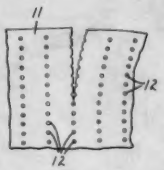
Wayne K. Dunshee, Maplewood, and Janice B. Odegaard, Afton, both of Minn., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 94,850, Nov. 16, 1979, abandoned, which is a continuation-in-part of Ser. No. 886,059, Mar. 13, 1978, abandoned. This application Jun. 15, 1981, Ser. No. 273,973

Int. Cl.³ A61F *13/00*

U.S. Cl. 128—155 8 Claims

1. A conformable adhesive sheet material having viscoelastic properties similar to human skin comprising a backing sheet consisting essentially of chlorinated polyethylene and a pressure sensitive adhesive on at least a portion of at least one surface of said backing sheet, said backing sheet requiring less than about 25×10^6 dynes/cm^2 for an elongation of 20% as tested per ASTM Standard D-882 and having a stress relaxation with time when elongated 20% initially of from about 10% to about 20% after 1 minute and from about 20% to about 50% after 10 minutes.



4,346,701

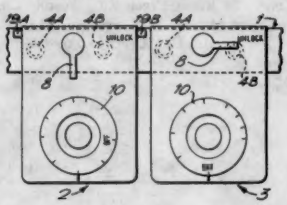
GAS ADMINISTRATION APPARATUS

David J. Richards, Bradford, England, assignor to The Medishield Corporation Limited, London, England

Filed Mar. 28, 1980, Ser. No. 134,803

Int. Cl.³ A61M *11/00*

U.S. Cl. 128—200.14 7 Claims



1. An anesthesia machine comprising a gas-administration apparatus, and a gas flow unit removably mounted on said gas administration apparatus in a plug-in fashion, said gas flow unit having control means to control the flow of gas to said gas flow unit from said gas-administration apparatus, at least one gas port in said gas-administration apparatus to conduct gas to said gas flow unit, locking means movable between a lock position wherein said gas flow unit is secured to said gas-administration apparatus and an unlock position, and interlock means cooperating with said locking means, said interlock means preventing said control means from allowing flow of gas from said gas-administration apparatus to said gas flow unit unless said locking means is in its lock position, valve means in said at least one port normally closing each of said at least one port, said gas flow unit further including actuating means to move said valve means to open said at least one port only when said locking means is in its lock position.

4,346,702

SLIP JOINT OF ENDOTRACHEAL TUBE

Yukio Kubota, No.1-12, Uenohigashi 1-chome, Toyonaka-shi, Osaka-fu, Japan

Filed Dec. 2, 1980, Ser. No. 212,129

Claims priority, application Japan, May 1, 1980, 55-59004

Int. Cl.³ A61M *25/02*

U.S. Cl. 128—207.14 4 Claims

1. A slip joint of an endotracheal tube or a tracheostomy cannula comprising

a slip joint body having opposing open ends and a passageway therebetween, means on one of said open ends adapted to be connected to an endotracheal tube or to a tracheostomy cannula, means on the other of said open ends adapted to be connected to a breathing gas source,

said body being provided in its side wall with a L-slot having a first leg disposed in the direction of said passageway, said first leg having an upper open end terminating in said other of said open ends of said slip joint body and also having a width capable of passing a catheter therethrough to be used, and the other leg of said L-slot terminating in a semicircle slightly smaller than a semicircle of the cross section of a catheter to be used, and

a ring adaptor slidably mounted around the side wall of said slip joint body in close contact therewith, said adaptor having opposing open ends and being provided in its side wall with an L-slot having a first leg disposed to align with the other leg of said L-shaped slot in said slip joint body, said first leg having an open end terminating in one of said opposing open ends of said ring adaptor and having the same width as the first leg of the L-slot of said slip

joint body, the other leg of said L-slot in said ring adaptor being disposed to align with the other leg of said L-slot in said slip joint body and terminating in a semicircle having the same size as the semicircle at the end portion of the L-slot of said slip joint body, the other leg of said L-slot in said ring adaptor extending laterally from the first leg in a direction opposite to the direction in which the other leg of the L-slot in said slip joint body extends from its first leg, and said ring adaptor being movable around the side wall of said slip joint body such that the semicircular end portion of the L-slot in the slip joint body and the semicircular end portion of the inverted L-slot in the ring adaptor form a circular hole which has a diameter slightly smaller than the outer diameter of the catheter to be used and in which the catheter can be inserted and hermetically sealed.

4,346,703

SOLUTION CONTAINER FOR CONTINUOUS AMBULATORY PERITONEAL DIALYSIS

T. Michael Dennehey, Arlington Heights; Richard J. Greff, Ingleside, and Ludwig Wolf, Jr., Crystal Lake, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 27,419, Apr. 5, 1979, abandoned, which is a continuation-in-part of Ser. No. 5,748, Jan. 23, 1979, abandoned. This application Sep. 15, 1980, Ser. No. 187,008

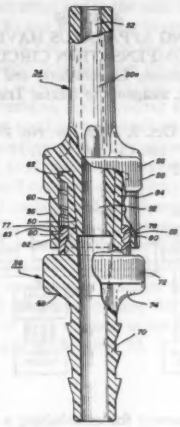
Int. Cl.³ A61J 7/00

U.S. Cl. 128—213 A **40 Claims**

1. Equipment for continuous ambulatory peritoneal dialysis in which a solution container is coupled via flexible tubing to a patient's tube that communicates with the patient's peritoneal cavity, which comprises:

a flexible, foldable plastic dialysis solution container having a transfer port extending therefrom;

a flexible tube extending from said transfer port and having a luer connector at its distal end for connecting to a luer connector carried by the patient's tube, said luer connector at said distal end and said patient's tube luer connector comprising a cooperating male luer connector and female luer connector, said male luer connector having a central tubular portion defining an axial bore with at least a portion of said central tubular portion being enclosed by an outer sheath having a generally circular cross-sectional configuration, said outer sheath having a threaded internal wall, and a female luer connector comprising a main tubular member, said male luer central tubular portion and said female luer main tubular member being cooperative to provide a first liquid seal, said female luer connector having an outwardly extending flange adjacent its distal end, said flange being dimensioned to threadedly cooper-



ate with the threads on the internal wall of said male luer connector's outer sheath, and a sealing means for providing a second liquid seal with the internal wall of said outer sheath when the male and female connectors are connected, to aid in maintaining a water-tight bacteria barrier at the luer connection.

4,346,704

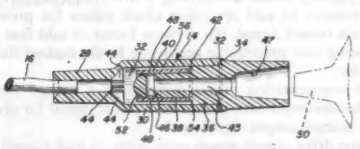
SLEEVE VALVE FOR PARENTERAL SOLUTION DEVICE

Lee K. Kulle, Mundelein, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Sep. 9, 1980, Ser. No. 185,478

Int. Cl.³ A61M 5/14

U.S. Cl. 128—214 R **12 Claims**



1. In a sleeve valve carried in a parenteral solution administration device, which valve comprises an outer housing defining an outlet tube; an inner tubular support defining an inlet tube and having a closed forward end positioned within the outer housing, plus lateral aperture means communicating between the bore of said tubular support and the exterior thereof; and an elastic tube surrounding said inner tubular support to cover said lateral aperture means, the improvement comprising, in combination:

said inner tubular support being free of elastic, tube-retaining structure means at its closed end and adapted to permit said elastic tube to be laterally slidable on said inner tubular support through a limited distance, said outer housing defining vane means to limit the lateral advancement of said elastic tube on said support, and shoulder means positioned about said support to limit the lateral retraction of said elastic tube away from the closed end, said elastic tube covering said apertures in all lateral sliding positions,

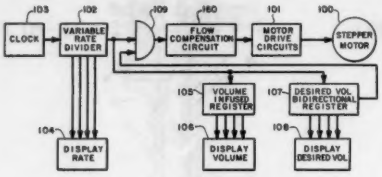
whereby, upon pressurized fluid flow through said inlet tube, said elastic tube is expanded by pressure to permit fluid flow between said tube and tubular support out of both ends of the elastic tube, the resulting flow proceeding through said vanes and said outlet tube.

4,346,705

METERING APPARATUS HAVING RATE COMPENSATION CIRCUIT

Michael O. Pekkarinen, Lincolnshire, and Norm Shim, Glenview, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Del.

Filed Oct. 9, 1980, Ser. No. 195,432
Int. Cl.³ A61M 31/31
U.S. Cl. 128—214 F 14 Claims



1. Metering apparatus for establishing a desired fluid flow rate through a fluid administration set of the type including a compressible tubing segment, said apparatus comprising, in combination:

a housing;

a flow metering head including a rotor mounted on said housing for rotation about a fixed axis, said rotor including a plurality of pressure rollers disposed about the circumference thereof, and a pressure plate for positioning the compressible tubing segment in compressive engagement with at least a portion of said rollers, whereby an incremental volume of fluid is pumped through said tubing segment with a predetermined increment of rotation of said rotor, said incremental volume of fluid being subject to variation from dimensional variations in the flow metering head;

means including a stepper motor for driving said rotor;

a source of repetitive clock pulses;

rate setting means comprising a first frequency divider responsive to said repetitive clock pulses for providing a first output signal, the division factor of said first divider being user-presettable according to the desired fluid flow rate;

rate compensation means comprising a second frequency divider responsive to said first output signal for providing a second output signal; and

motor drive circuit means responsive to said second output signal for applying motor control signals to said stepper motor according to the frequency of said second output signal, said second frequency divider providing a preset division factor compensating said first output signal for the variation in said incremental volume brought about by dimensional variations in said metering head whereby the desired flow rate is established in the administration set.

4,346,706

PARENTERAL ADMINISTRATION OF NUTRIMENTS

Harry H. LeVeen, 800 Poly Pl., Brooklyn, N.Y. 11220, and Vincent A. Piccone, 377 Gansevoort Blvd., Staten Island, N.Y. 10314

Continuation of Ser. No. 25,374, Mar. 30, 1979, abandoned. This application Mar. 2, 1981, Ser. No. 239,474
Int. Cl.³ A61M 5/00
U.S. Cl. 128—214 R 6 Claims

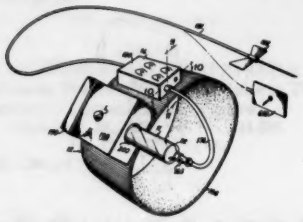
1. A method for parental administration of nutriments which comprises opening the umbilical vein and thereafter introducing into the vein an aqueous hyperalimentary solution of nutriments.

4,346,707

PISTON DRIVE ARRANGEMENT FOR INJECTOR

Douglass G. Whitney, 2518 W. Wesley Rd., and John K. Martin, III, 2837 Ridge Wood Cir., both of Atlanta, Ga. 30327

Division of Ser. No. 1,091, Jan. 8, 1979, Pat. No. 4,273,122, which is a continuation-in-part of Ser. No. 741,528, Nov. 12, 1976, Pat. No. 4,150,672, which is a continuation-in-part of Ser. No. 964,953, Nov. 30, 1978, Pat. No. 4,235,235. This application Mar. 27, 1981, Ser. No. 248,484
Int. Cl.³ A61M 5/20
U.S. Cl. 128—214 F 1 Claim



1. In an apparatus for dispensing liquid including a liquid chamber with an outlet slidably mounting a piston therein for sliding movement axially along an expelling axis toward the outlet to force liquid from the outlet and a drive member movable axially along the expelling axis to engage and force the piston toward the outlet; the improvement comprising:

a pointed driving projection on that end of said drive member facing the piston coaxially aligned with the expelling axis; and a driven member carried by the piston, said driven member defining a conical bearing surface thereon opening toward said pointed driving projection and having an apex in registration with said expelling axis, said conical bearing surface angling away from said expelling axis with equal angles therearound so that said pointed driving projection engages said conical bearing surface in said apex to axially move said piston along said expelling axis with the force exerted on said piston by the drive member equally distributed circumferentially about said piston to prevent canting of said piston in said liquid chamber.

4,346,708

SYRINGE

Harry H. LeVeen, 321 Confederate Cir., Charleston, S.C. 29407; Robert F. LeVeen, 312 Lombard St., Philadelphia, Pa. 19147, and Eric G. LeVeen, 3-3 Woodlike Rd., Albany, N.Y. 12203

Filed Apr. 20, 1981, Ser. No. 255,353
Int. Cl.³ A61M 1/00
U.S. Cl. 128—236 8 Claims

1. A manually actuable syringe comprising:

a hollow body with an interior wall, a fluid transport opening at one end thereof and a piston receiving opening at the opposite end thereof;

a piston within said body which has fluid tight engagement

with said interior wall, said piston being slidable toward and away from said transport opening;

a manually operable actuating rod extending at one end from said piston receiving opening and slidable within said body, said rod having an axial bore;

compressible spring means interconnecting said piston and the end of said actuating rod nearest said piston; and

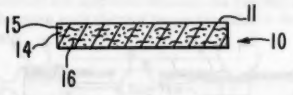
an indicator rod connected at one end to said piston for movement therewith and slidably mounted in said bore of said actuating rod with a portion thereof visible from exteriorly of said body, whereby the position of said portion of said indicator rod is dependent on the position of said piston and the compression of said compressible spring means and indicates the pressure applied by the piston to a fluid within said body.

4,346,709

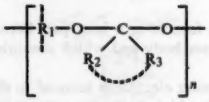
DRUG DELIVERY DEVICES COMPRISING ERODIBLE POLYMER AND EROSION RATE MODIFIER

Edward E. Schmitt, Palo Alto, Calif., assignor to ALZA Corporation, Palo Alto, Calif.

Filed Nov. 10, 1980, Ser. No. 205,636
Int. Cl.³ A61M 7/00
U.S. Cl. 128—260 **100 Claims**



1. A device for delivering a beneficial drug at a controlled rate over a prolonged period, said device shaped, sized and adapted for delivering a drug to an animal environment of use, the device comprising: (A) an erodible released rate controlling polymer of the formula:



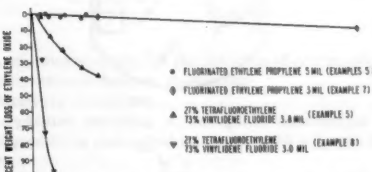
wherein (I) R_1 is a member selected from the group consisting of divalent, trivalent and tetravalent radicals consisting of alkylene of 1 to 10 carbons; alkenylene of 2 to 10 carbons; alkyleneoxy of 2 to 6 carbons; cycloalkylene of 3 to 7 carbons; cycloalkylene of 3 to 7 carbons substituted with an alkyl of 1 to 7 carbons, alkoxy of 1 to 7 carbons, an alkenyl of 2 to 7 carbons, and an alkylene of 1 to 10 carbons; cycloalkylene of 4 to 7 carbons; cycloalkenylene of 4 to 7 carbons substituted with an alkyl of 1 to 7 carbons, an alkoxy of 1 to 7 carbons, alkenyl of 2 to 7 carbons, and an alkylene of 1 to 10 carbons; arylene of 6 to 12 carbons; arylene of 6 to 12 carbons substituted with an alkyl of 1 to 7 carbons, alkyloxy of 1 to 7 carbons, alkenyl of 2 to 7 carbons, and alkylene of 1 to 10 carbons; wherein (II) R_2 and R_3 are selected from the grop consisting of alkyl of 1 to 7 carbons, alkenyl of 2 to 7 carbons, aryl or 6 to 12 carbons, an oxygen atom covalently bonded to the dioxycarbon atom, and when an oxygen atom R_2 and R_3 are a member selected from the group consisting of alkyloxy of 1 to 7 carbons; alkenyloxy of 2 to 7 carbons; and aryloxy of 6 to 12 carbons; and when only one of R_2 and R_3 is selected from said member the other R_2 and R_3 is selected from the group consisting of alkyl of 1 to 7 carbons; alkenyl of 2 to 7 carbons; and aryl of 6 to 12 carbons; wherein (III) R_2 and R_3 are intramolecularly covalently bonded to each other and to the same dioxycarbon atom, with at least one of R_2 and R_3 a ring oxygen atom forming a heterocyclic ring of 5 to 8 carbon and oxygen atoms when R_2 and R_3 are selected from the group consisting of alkylene of 2 to 6 carbons; alkenylene of 2 to 6 carbons; alkyleneoxy of 2 to 6 carbons; alkenyleneoxy of 2 to 6 carbons; alkylenedioxy of 2 to 5 carbons; alkenylenedieoxy of 2 to 5 carbons; oxa; and a heterocyclic ring of 5 to 8 carbon and oxygen atoms substituted with an alkyl of 1 to 7 carbons, an alkyloxy of 1 to 7 carbons, an alkenyl of 2 to 7 carbons, and an alkenyloxy of 2 to 7 carbons; wherein (IV) R_2 and R_3 are intramolecularly covalently bonded to each other and to the same dioxycarbon atom with at least one of R_2 and R_3 is a ring oxygen atom forming a fused polycyclic ring of 8 to 12 carbon and oxygen atoms when R_2 and R_3 are a member selected from the group consisting of aralkylene of 8 to 12 carbons; aralkenylene of 8 to 12 carbons, aryloxy of 8 to 12 carbons; aralkyleneoxy of 8 to 12 carbons; aralkenyleneoxy of 8 to 12 carbons, aralkylenedioxy of 8 to 12 carbons; aralkenylenedioxy of 8 to 12 carbons; oxa; and a fused polycyclic ring of 8 to 12 carbon and oxygen atoms substituted with an alkyl of 1 to 7 carbons, an alkyloxy of 1 to 7 carbons, an alkenyl of 2 to 7 carbons and an alkenyloxy of 2 to 7 carbons; wherein (V) R_2 and R_3 are intramolecularly covalently bonded to each other and to the same dioxycarbon atom to form a 5 to 6 member carbocyclic ring; (B) a beneficial drug in the device; (C) an erosion rate modifier in the device in an amount that effects the period of time the device erodes and effects the amount of drug released as the device erodes over time; and wherein n is greater than 10.

4,346,710

ARTICLE FOR STORAGE AND TRANSPORT OF BIOGENIC FLUIDS

Chandrakant B. Thanawalla, Exton; John R. Soulen, Narberth, and Harold G. Monsimer, Norristown, all of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 916,454, Jun. 16, 1978, abandoned. This application May 12, 1980, Ser. No. 148,000
Int. Cl.³ A61J 1/00
U.S. Cl. 128—272 **3 Claims**

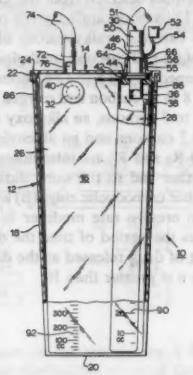

PERCENT WEIGHT LOSS OF ETHYLENE OXIDE
TIME, IN MINUTES
FLUORINATED ETHYLENE PROPYLENE 5 MIL (EXAMPLES 5 & 6)
FLUORINATED ETHYLENE PROPYLENE 3 MIL (EXAMPLE 7)
27% TETRAFLUOROETHYLENE 73% VINYLIDENE FLUORIDE 3.8 MIL (EXAMPLE 5)
27% TETRAFLUOROETHYLENE 73% VINYLIDENE FLUORIDE 3.0 MIL (EXAMPLE 8)

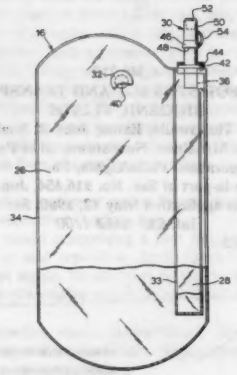
1. An article for storing and transporting biogenic fluid comprising a container formed of additive-free uncharged transparent thermoplastic of a polymer of vinylidene fluoride copolymerized with at least one monomer selected from the group consisting of tetrafluoroethylene and hexafluoropropene, wherein said vinylidene fluoride constitutes at least sixty-two percent by weight of the copolymer composition, the permeability to ethylene oxide of said thermoplastic being at least approximately 1×10^{-6} grams per minute of gaseous ethylene oxide per square centimeter of film of such thermoplastic having a thickness between 3 and 4 mils.

4,346,711
BODY FLUID COLLECTION DEVICE WITH DISPOSABLE LINER

Ronald T. Agdanowski, St. Peters, and Thomas F. Schuessler, Hillsboro, both of Mo., assignors to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed Jan. 16, 1981, Ser. No. 225,577
Int. Cl.³ A61M *1/00*
U.S. Cl. 128—276 **21 Claims**



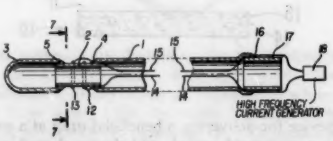


1. A body drainage collection device comprising a canister having interior and exterior sides and including a container closed at the lower end and open at the upper end and a removable cover for sealingly closing the upper end of said container, and a disposable liner removably insertable into said container and including a pliable bag having upper and lower end portions, fluid connector means sealingly connected to the upper end portion of said bag in fluid communication with the interior of said bag and having an outer portion externally of said bag for connection with the body of a patient, and gas passage means adjacent the upper end portion of said bag for allowing gas to flow from the interior to the exterior of said bag, said canister having releasable locking means for said connector means on an upper portion thereof including an opening through said canister upper portion for receiving said outer portion of said connector means and releasably locking said connector means to said canister, and lock release means on and manually operable from the exterior side of said canister upper portion for releasing said locking means to release said connector means and bag from said canister, and means for connecting the interior of said container to a source of suction.

4,346,712
RELEASABLE BALLOON CATHETER

Hajime Handa; Yasuhiro Yonekawa; Sen Yamagata; Waro Taki, all of Kyoto; Yoshito Ikada, and Hiroo Iwata, both of Uji, all of Japan, assignors to Kuraray Company, Ltd., Kurashiki, Japan

Filed Feb. 13, 1980, Ser. No. 121,036
Claims priority, application Japan, Apr. 6, 1979, 54-42197; Sep. 14, 1979, 54-118634
Int. Cl.³ A61B *17/12*
U.S. Cl. 128—325 **12 Claims**



1. A releasable balloon catheter, comprising:
a tubular catheter body;
an inflatable balloon provided at one end of said catheter body for holding a curable liquid introduced into the balloon from the catheter;
a severable tube formed at a joint part between said balloon and said catheter body and which comprises a hydrophilic polymer;
a plurality of bipolar electrodes secured to the severable tube through which a high frequency current is flowable;
means for generating a high-frequency current and connected to each of said bipolar electrodes; and
said balloon catheter being constructed such that when said balloon catheter is inserted into a vessel and carried to the desired site by the blood stream and the balloon is inflated by the introduction of said curable liquid into the balloon through the catheter body and is fixed face-to-face with the wall of the vessel at the desired site and said generating means communicates said high frequency current across said electrodes, said severable tube is heated so as to be melted or dissolved, such that said tube is cut to release said balloon from said catheter.

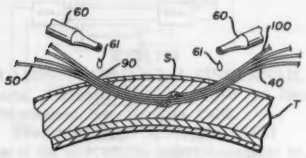
4,346,713
HAIR REPLACEMENT METHOD

Oscar Malmin, 127 E. Wayne Ave., Akron, Ohio 44301

Continuation-in-part of Ser. No. 876,482, Feb. 9, 1978, abandoned, which is a continuation-in-part of Ser. No. 855,272, Nov. 28, 1977, abandoned. This application Aug. 21, 1978, Ser. No. 935,521
Int. Cl.³ A61B *17/00*
U.S. Cl. 128—330 **4 Claims**

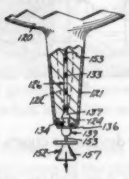
1. A method of securing replacement strands of hair to the head of a human being comprising the steps of:
(A) forming at least a first strand of hair into a U-shaped loop;
(B) penetrating the scalp and passing said first strand

through the scalp tissue so that the base of the loop and the open ends thereof project beyond the surface of the scalp;
(C) forming at least a second strand of hair into a U-shaped loop;
(D) interengaging said first and second strands;
(E) forming a third strand of hair into a U-shaped loop;
(F) passing said third strand through the scalp tissue so that the base of the loop and the open ends thereof project



beyond the surface of the scalp in opposed relation to the base and open ends of said first strand;
(G) forming a fourth strand of hair into a U-shaped loop;
(H) interengaging said third and fourth strands;
(I) pulling said first and second and said third and fourth strands in opposite directions until the interengaged portions thereof are disposed beneath the surface of the scalp with the open ends thereof projecting above the surface of the scalp.

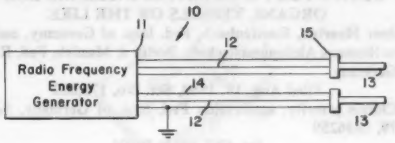
4,346,714
METHOD OF INSERTING TEAT DILATOR
Francis W. Child, Eagle Bend, Minn., assignor to Child Laboratories Inc., Eagle Bend, Minn.
Continuation-in-part of Ser. No. 55,994, Jul. 9, 1979, Pat. No. 4,281,658. This application Sep. 8, 1980, Ser. No. 185,179
Int. Cl.³ A61M *29/00*
U.S. Cl. 128—343 **13 Claims**



1. A method of inserting a dilator into the duct of a teat of a bovine animal, said dilator having a tubular member with a longitudinal passage and a one-way valve joined to the tubular member with an inserter having an elongated rod comprising: mounting the dilator on the elongated rod of the inserter by moving the rod through the one-way valve and locating the rod in the passage of the tubular member, inserting the tubular member and rod through the duct outlet into the duct of the teat, removing the inserter from the dilator, and leaving the dilator in its inserted position.

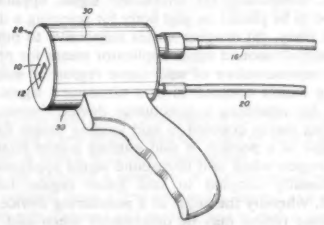
4,346,715
HYPERTHERMIA HEATING APPARATUS
Paul M. Gammell, Altadena, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Continuation of Ser. No. 918,705, Jul. 12, 1978, abandoned. This application May 13, 1980, Ser. No. 149,526
Int. Cl.³ A61N *1/32*
U.S. Cl. 128—422 **7 Claims**

1. An improved array of electrodes for use in delivering electromagnetic energy to a localized area of a patient's body in a hyperthermic treatment so that said improved array of electrodes provides a uniform distribution of electromagnetic flux lines within the localized area of the patient's body in order to produce a uniform and localized heating gradient, said improved array of electrodes comprising:
a. a plurality of electrodes which are arranged in sets of electrodes, each of said sets of electrodes having two of said electrodes which are spaced a particular distance apart from



each other, pairs of said sets of electrodes being spaced apart a distance which is relatively greater than said particular distance and arranged in oppositely disposed pairs whereby the localized area of the patient's body is disposed between each of said sets of electrodes of each of said pairs of said sets of electrodes; and
b. electromagnetic energy means for applying electromagnetic energy to each of said pairs of said sets of electrodes.

4,346,716
MICROWAVE DETECTION SYSTEM
Kenneth L. Carr, Harvard, Mass., assignor to M/A COM, Inc., Burlington, Mass.
Filed Mar. 31, 1980, Ser. No. 135,506
Int. Cl.³ A61B *5/05*
U.S. Cl. 128—653 **19 Claims**



1. A microwave system for the detection of cancer employing non-invasive techniques, comprising:
a microwave transmitter,
an applicator including a waveguide construction and adapted to be maintained in contact with a human body site,
means coupling the microwave transmitter to the applicator for establishing at the applicator a heating temperature greater than the normal human body temperature,
means defining a sensing aperture including a second waveguide construction also adapted to be maintained in contact with a human body site,
a microwave radiometer,
means coupling the sensing aperture to the microwave radiometer whereby the radiometer is for sensing at a resolution of fractions of a centigrade degree,
and housing means for commonly supporting at least said applicator and aperture in close proximity to each other whereby the localized heating enhances differential heating associated with the thermal characteristics of tumors to enable early detection,
said housing means including means for permitting an opera-

tor to hold the housing means to enable contact under manual control with the human body,

said applicator waveguide construction comprising a ridged waveguide having means defining a ridge,

said aperture waveguide construction comprising a rectangular waveguide disposed in the ridge of the applicator waveguide construction.

4,346,717

DEVICE FOR PUNCTUATING INTERNAL BODY ORGANS, VESSELS OR THE LIKE

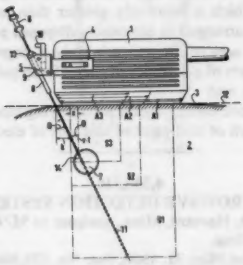
Rainer Haerten, Roettenbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 18, 1980, Ser. No. 179,082

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1979, 2936259

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—660 **29 Claims**



1. An ultrasound imaging apparatus for use with a puncturing device to facilitate puncturing of a body by said puncturing device, comprising (a) ultrasound signal applicator means adapted to be placed on said body for scanning a tissue region of said body, (b) imaging means responsive to output signals from said ultrasound signal applicator means for producing an image representative of said tissue region of said body, (c) guiding means coupled to said ultrasound signal applicator means for attaching a puncturing device thereto, (d) angle detecting means coupled to said guiding means for detecting the angle of a portion of said guiding means relative to said tissue region when said ultrasound signal applicator means is operationally coupled to said tissue region for scanning thereof, whereby the angle of a puncturing device relative to said tissue region may be determined when said puncturing device is attached to said guiding means for treatment of said body, and (e) directing circuit means coupled to said angle detecting means and responsive thereto for producing and superimposing on said body image a guide image beam having an orientation relative to said body image representative of the angle of said guiding means relative to said tissue region, whereby a desired orientation of said guiding means portion may be chosen to facilitate operation of a puncturing device attached thereto.

4,346,718

APPARATUS AND METHODS FOR RECORDING TIME INTERVALS

Julian R. W. Morris, Abingdon, England, assignor to Oxford Medical Systems Limited, Abingdon, England

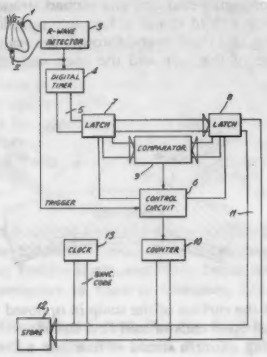
Filed Feb. 14, 1979, Ser. No. 12,111

Claims priority, application United Kingdom, Feb. 22, 1978, 6964/78

Int. Cl.³ A61B *5/04*

U.S. Cl. 128—710 **15 Claims**

1. Apparatus for recording time intervals between repetitive events comprising means for measuring time intervals between successive such events, means for comparing the value of each succeeding time interval with the value of the previous time interval to indicate equality or non-equality to a predetermined degree of resolution, means for counting the number of succes-



sive indications of equality, and means for storing the said number together with the value of the previous time interval if non-equality is indicated.

4,346,719

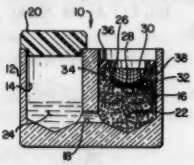
CIGARETTE EXTINGUISHER

John A. Hilkene, 650 Seventh St., Lyndhurst, N.J. 07071

Filed May 4, 1981, Ser. No. 259,855

Int. Cl.³ A24F *19/14*

U.S. Cl. 131—236 **12 Claims**



1. An extinguishing device for cigars, cigarettes, and the like, comprising:

a housing having a first hollow compartment therein for containing an extinguishing liquid, and a second hollow compartment therein containing a capillary material which provides sufficiently small pores therethroughout to provide by capillary action wetting of the capillary material when extinguishing liquid is introduced into said second compartment, said capillary material being such as to maintain its integrity when wetted with extinguishing liquid, and at least said second compartment having an open end;

transfer means for transferrng extinguishing liquid from said first compartment of said housing to said second compartment of said housing to thereby wet said capillary material in said second compartment;

an extinguishing member of wetable material for said open end of said second compartment for extinguishing a lighted article which comes into contact therewith, said extinguishing member including a bottom portion and a side wall portion which extends away from said bottom portion, said extinguishing member being supported in said open end of said second compartment so that (1) said bottom portion is at a lower elevation than said side wall portion; (2) at least the underside of said bottom portion of said extinguishing member is in contact with a first part of

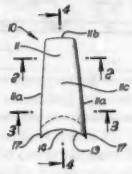
said capillary material; and (3) at least a second part of said capillary material is in juxtaposition with said side wall portion of said extinguishing member and at a higher elevation than said bottom portion of said extinguishing member, whereby at least said bottom portion of said extinguishing member is continuously wetted by said capillary material when extinguishing liquid is introduced into said second compartment.

4,346,720

CLAMP-ON ARTIFICIAL FINGERNAIL

Yosh Hokama, Torrance, Calif., assignor to International Beauty Distributors, Inc., Gardena, Calif.

Filed May 29, 1979, Ser. No. 43,021
The portion of the term of this patent subsequent to Jan. 23, 1996, has been disclaimed.
Int. Cl.³ A45D *29/00*
U.S. Cl. 132—73 **12 Claims**



1. A solid artificial fingernail attachable to a natural fingernail, comprising

(a) a thin plastic sheet element sized to provide, when attached to the natural fingernail, a forward and longitudinal extension of the natural fingernail,

(b) said element having a generally U-shaped boundary region extending forwardly of the rearwardmost extent of the element,

(c) said element having a longitudinally elongated upper arch region with curvature such that the lateral sides of the element extend generally downwardly from the arch to be spread apart when said sides are pressed down on a natural nail,

(d) said lateral sides having thickness at said boundary region, substantially in excess of the thickness of the element at said elongated arch region,

(e) said element gradually increasing in thickness from said upper arch region laterally toward said lateral boundary region along each of said lateral sides to facilitate relative and flexible spreading of said lateral sides together with flexible bending of said arch region, for downwardly gripping the natural fingernail.

4,346,721

HAIR BRUSH WITH HAIR CUTTING BLADE

Bernard Molaro, 232 Rue de Courcelles, 75017 Paris, France

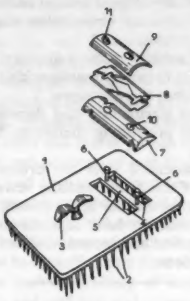
Filed May 21, 1980, Ser. No. 151,878
Claims priority, application France, May 22, 1979, 79 13030
Int. Cl.³ A45D *44/18*
U.S. Cl. 132—85 **13 Claims**

1. A hair brush, comprising:

(a) an essentially flat, rigid support having two openings;

(b) a plurality of semi-rigid thread-like parts protruding generally perpendicularly from one face of the support and constituting bristles of the brush, and

(c) a double edged blade, and means for securing the blade on the support, each cutting edge of the blade extending through a respective one of the openings and being generally level with said one face of the support from which the thread-like parts protrude.

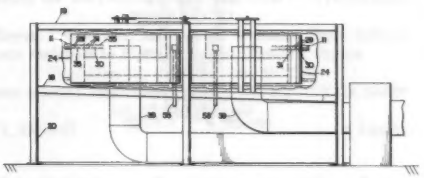


4,346,722

APPARATUS USED IN THE TREATMENT OF CANS

Alex J. Schregenberger, Neshanic, N.J., assignor to Midland-Ross Co., Cleveland, Ohio

Filed Feb. 12, 1979, Ser. No. 11,221
Int. Cl.³ B08B *3/00*
U.S. Cl. 134—62 **21 Claims**



1. An apparatus used in the treatment of hollow cylindrical containers having a pair of opposing ends, one of which is open and the other of which is closed, comprising:

(a) means for holding a plurality of containers in equally spaced relation from a first axis and a second axis which are vertically disposed and parallel, and in such a way that the longitudinal axes of the containers are angularly oriented relative to the first and second axes;

(b) means for rotating the containers about the first axis in a horizontal pathway from a first position to an arcuately spaced second position while maintaining one end of the pair of opposing ends of each container closer to the first axis than the other end thereof;

(c) means for transferring the containers from the second position to a third position which is substantially opposite the second position;

(d) means for rotating the containers about the second axis in a horizontal pathway from the third position to an arcuately spaced fourth position while maintaining the other end of the pair of opposing ends of each container closer the second axis than the one end thereof;

(e) means for removing, the containers from the fourth position;

(f) means disposed adjacent the horizontal pathways which the containers travel between the first and second positions and the third and fourth positions, for contacting the containers with fluid, under pressure, used in the treatment of the containers;

the container holding means (a), including:

(I) a pair of drums rotatable about the first and second axes;

(II) a plurality of rows of orifices circumferentially spaced and horizontally aligned around each of the drums, the orifices of adjacent rows being staggered vertically around the drums;

(III) a pair of annular recesses disposed circumferentially of each of the drums and sandwiching a pair of adjacent rows of orifices therebetween;

(IV) a resilient elastomeric ring disposed in each of the recesses and protruding therefrom for engaging containers; and

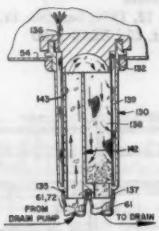
(V) means associated with the drums for drawing air exteriorly of the drums radially inwardly through the orifices into the interior of the drums, when the orifices and any containers held adjacent thereto are rotated between the first and second positions and the third and fourth positions.

4,346,723

APPARATUS FOR A WAREWASHER BYPASS SOIL COLLECTOR

Paul B. Geiger, Piqua, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Mar. 25, 1981, Ser. No. 247,449
Int. Cl.³ B08B *3/02*
U.S. Cl. 134—104 **6 Claims**



1. In a dishwasher which utilizes multiple fluid fills for sequentially washing and rinsing food ware items during a complete cycle, said dishwasher having a wash chamber including rack means for receiving and supporting food ware items therein and a sump at the bottom of said chamber for containing fluid therein; primary spray means including a wash pump operable in a recirculating mode for recirculating and spraying fluid from said sump onto food ware items to remove food soil particles therefrom and carry food soil particles to the sump; a drain system having a drain inlet adjacent the bottom of said sump, a drain outlet communicating with a drain, and a drain pump operable in a draining mode for pumping fluid and food soil particles therein from said sump to a drain at intervals between successive fluid fills; and soil collector means for continuously collecting and removing food soil particles from fluid in said sump while said primary spray means is operating; the improvement comprising:

(a) said soil collector means comprising a soil collecting circuit having an inlet connected to receive fluid from said drain pump, a return outlet located within said wash chamber, and a portion, independent of said primary spray means and said wash chamber, in fluid communication with said inlet and said return outlet;

(b) said portion including a relatively fine screen soil collecting filter in said portion for removing food soil particles from fluid circulating through said soil collecting circuit to be retained within said portion during said recirculating mode, said filter having its upstream side in position to have collected soil particles flushed therefrom toward said drain outlet and into a drain during said draining mode; and

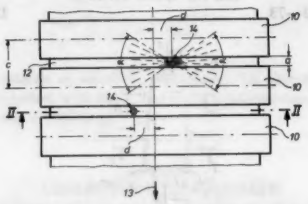
(c) means for selectively controlling said dishwasher to operate said drain pump in either a soil collecting mode by circulating fluid through said soil collecting circuit while said primary spray means is recirculating and spraying fluid onto food ware items or in a drain mode to simultaneously pump fluid and soil particles from said sump during draining.

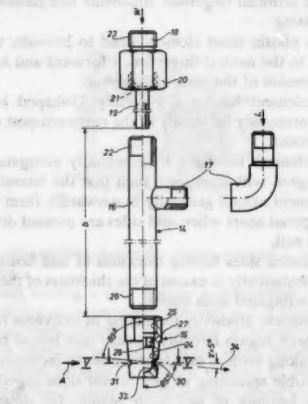
4,346,724

APPARATUS FOR SPRAYING A COOLANT ON A STEEL SLAB

Sepp Mezger, Eningen; Kurt Lerch; Hans Schrewe, both of Dusseldorf, and Fritz-Peter Pleschiutschnigg, Dortmund, all of Fed. Rep. of Germany, assignors to Lechler GmbH & Co. KG, Fellbach and Mannesmann AG, Dusseldorf, both of, Fed. Rep. of Germany

Filed Feb. 11, 1981, Ser. No. 233,563
Int. Cl.³ B08B *3/02*
U.S. Cl. 134—122 R **8 Claims**





1. Apparatus for spraying a coolant on steel slabs by means of spraying nozzles preceded by a mixing chamber with separate feeds for the propellant and the coolant, the nozzle discharge being designed so that the mixture of propellant and coolant is incident in the form of wide fans and at acute angle in mutually opposite directions on the slab surface, that the nozzle discharges start from a common nozzle housing into which issues the mixing chamber, and the coolant connection to the mixing chamber being an exchangeable inset tube penetrating the mixing chamber, in particular for slab-format continuous casting issuing from a continuous casting mold, the particular nozzles acting in the gap between two adjoining guide rollers for the cast slab being oriented parallel to the axes of the guide rollers and the nozzle housing being mounted between the plane of the guide roller axes and the slab surface, characterized in that the cylindrical or mearly cylindrical nozzle housing (15) which is provided with a cylindrical feed

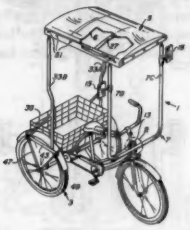
bore (24) comprises one prismatic milling (30, 31) each at two diametrically opposite locations as nozzle discharges (33), each said milling issuing radially into the feed bore (24).

4,346,725

TRICYCLE CANOPY

Leon L. Shaw, 1811 W. Prince Rd., Sp. 7, Tucson, Ariz. 85705

Filed Feb. 7, 1980, Ser. No. 119,633
Int. Cl.³ B62J *17/08*
U.S. Cl. 135—7 4 Claims



1. A tricycle canopy comprising in combination:

a flexible cover for extending approximately from the front to the rear of a tricycle to shelter or shade a rider thereof;

a horizontal cover support frame for supporting said flexible cover wherein said cover support frame includes a pair of opposed substantially horizontal side members, a pair of opposed substantially horizontal end members rigidly attached to the respective ends of said side members, and a plurality of arched cross members rigidly attached to and extending between said pair of side members for producing a curved upper surface of said flexible cover, said horizontal side members lying in a plane;

means for fastening the periphery of said flexible cover to the periphery of said cover support frame, said fastening means including a plurality of snap fastener elements rigidly attached to the periphery of said cover support frame and a plurality of corresponding mating snap fastener elements attached to peripheral edge portions of said flexible cover for effecting taut fastening of said flexible cover to said cover support frame to enable the operator to easily attach the flexible cover to or remove the flexible cover from said cover support frame;

first and second front uprights lying in a plane perpendicular to the forward direction of travel of the tricycle, said first and second front uprights being spaced sufficiently far apart to prevent any interference of said first and second front uprights with handlebars of the tricycle or with the hands or arms of the operator of the tricycle, said first and second front uprights being composed of lightweight tubular material;

a horizontal front member for supporting said first and second front uprights, said horizontal member being integral with said first and second front uprights, said horizontal member being centrally rigidly attached to the frame head of the tricycle to rigidly support the first and second uprights;

clamping means rigidly attached to said horizontal member for clamping said horizontal member rigidly to the frame head of the tricycle;

first and second spaced rear uprights for rigid attachment to a first end portion of said tricycle, respectively, said first and second portions being respectively located approximately adjacent to opposed ends of the rear axle of the tricycle where said first and second front uprights, said horizontal front member, said first and second rear uprights, and said cover support frame are all formed of lightweight metal tube material; and

first, second, third and fourth prongs each having and upper end and a lower end, the upper end of each of said prongs being rigidly attached only to said cover support frame, said first, second, third and fourth prongs extending vertically downward from the plane of said cover support frame and extending into and being rigidly, directly attached to the upper end portions of said first and second front uprights and said first and second rear uprights, respectively, said upper end portions of said first and second front uprights and said first and second rear uprights being attached only to said first, second, third and fourth prongs, respectively, the lower portions of said first, second, third and fourth prongs being attached only to said upper end portions of said first and second front uprights and said first and second rear uprights, respectively, the upper end portions of said first and second front uprights and said first and second rear uprights being vertical, said attachment of said prongs to said cover support frame being sufficiently rigid to prevent sideways, forward, and backward tilting of said first and second front uprights and said first and second rear uprights due to moderate wind forces on said flexible cover when said flexible cover is fastened to said cover support frame;

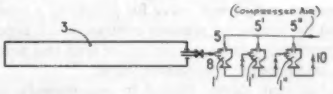
whereby said flexible cover can be easily removed from said cover support frame if a rider encounters dangerous wind conditions while he is riding the tricycle.

4,346,726

METHOD OF DRYING PIPELINES AND PUTTING GAS THEREINTO

Jean Bayen, Fanconville, and Patrick Scemama, Paris, both of France, assignors to Pipeline Service, Puteaux, France

Filed Dec. 12, 1979, Ser. No. 103,226
Claims priority, application France, Dec. 18, 1978, 78 35499
Int. Cl.³ F17D *1/02*
U.S. Cl. 137—15 6 Claims



1. A method of vacuum drying of a pipeline which is to transport a gaseous fluid, the method comprising:

connecting an ejector to one end of the pipeline, said ejector having a pressurized driving fluid injector nozzle, an aspiration chamber connected to the pipeline and a discharge port;

injecting a pressurized driving fluid into said ejector, thereby aspiring and entraining the water vapor and residual air from the pipeline to produce a fluid mixture in the aspiration chamber which is thence discharged from the discharge port, said injecting step continuing until the phase of drying the pipeline is substantially complete;

introducing the gas which is to be transported into the pipeline by displacing residual fluid from the pipeline by intake of the gas to be transported at the opposite end of the pipeline from that to which said ejector is coupled, while maintaining in the pipeline a vacuum corresponding to a pressure lower than the point at which the characteristic curves of the lower limits of flammability of the gas to be transported substantially meet;

putting the pipeline under suitable pressure; and

disconnecting the ejector when said gas which is to be transported reaches the ejector.

4,346,727

APPARATUS FOR MEASURING THE AMOUNT OF FLUID SUPPLIED BY A FLUID SUPPLY DEVICE

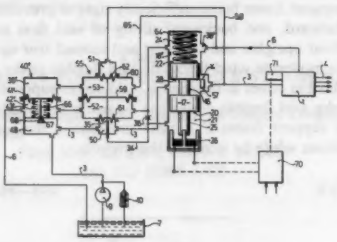
Gerhard Stumpp, Stuttgart, and Wolf Wessel, Oberriexingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 19,521, Mar. 12, 1979, Pat. No. 4,286,615. This application May 7, 1981, Ser. No. 261,332

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1978, 2812233

Int. Cl.³ G05D *11/03*

U.S. Cl. 137—117 11 Claims



1. A device for controlling the amount of fluid delivered by a fluid delivery device comprising:

a supply line for the fluid under pressure to the delivery device including a throttle element having an apportioning constant flowthrough cross-section orifice,

piston means integrated in the supply line for controlling said apportioning cross-section orifice in said throttle element,

a pressure comparison valve for providing a nominal value and for comparing pressure contrast which appears at said apportioning cross-section orifice with said nominal value in said pressure comparison valve,

an adjustment device related to said pressure comparison valve for providing a correcting regulation of said piston means, said adjustment device being activated in accordance with operation of said pressure comparison valve due to a deviation of said pressure contrast from said nominal value and wherein the position of said piston means provides a measure of the amount of flowing fluid per unit of time,

a fluid tank,

a return flow line connected to said fluid tank and wherein a part of the apportioned amount of fluid is returned through said return line to the fluid tank characterized by the fact that in said return line a constant flowthrough cross-section orifice is provided and,

a differential pressure valve operatively associated with said flowthrough cross-section orifice for the generation of a constant pressure contrast at said flowthrough cross-section orifice which is maintained constant by dumping of supply fluid by said differential pressure valve into said return flow line and to said fluid tank,

said pressure comparison valve comparing the pressure difference at said apportioning cross-section orifice of said throttle element with the pressure difference at said flowthrough cross-section orifice in said return line as said nominal value.

4,346,728

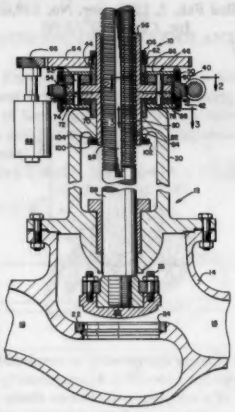
AUTOMATED DUAL MODE VALVE ACTUATOR

Harry E. Sulzer, Telford, Pa., assignor to Anchor/Darling Industries, Inc., Bala Cynwyd, Pa.

Filed Jul. 28, 1980, Ser. No. 172,560

Int. Cl.³ F16K *31/53, 29/00*

U.S. Cl. 137—243.6 10 Claims



3. A dual mode valve actuator for automatically controlling the operation of a valve having a valve stem, comprising:

a first drive motor activated during a first mode of valve actuator operation;

a first planetary drive assembly operatively coupled to the first drive motor and to the valve stem;

a second drive motor activated during second mode of valve actuator operation, and operatively coupled to the first planetary drive assembly;

a second planetary drive assembly operatively coupled to the second drive motor and to the valve stem;

whereby during the first mode of operation, said valve stem is driven by said first planetary drive assembly to move axially, and during the second mode of operation, the two planetary drive assemblies are driven into rotation to rotate the valve stem without axial movement thereof; the valve actuator further comprising torque sensing means for sensing the torque developed by the valve stem during the first mode of operation, the torque sensing means including control means for causing the actuator to operate in the second mode of operation by deactivating the first motor and activating the second motor when the torque sensed exceeds a predetermined torque limit.

4,346,729

TEMPERATURE CONTROL SYSTEM AND PUSHBUTTON CONTROLLED PNEUMATIC ACTUATOR

Rudolph J. Franz, Schaumburg, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 29, 1979, Ser. No. 43,291

Int. Cl.³ H01H *3/04;* F16K *11/02*

U.S. Cl. 137—353 2 Claims

1. A pushbutton actuated pneumatically operated actuator, said actuator comprising:

(a) body means, said body means defining

(i) a fluid chamber, and

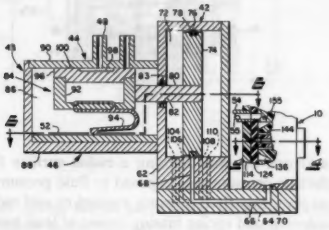
(ii) a plurality of spaced fluid outlet ports extending through a wall of said body means and in fluid communication with said chamber, with each of said ports connected to an associated outlet fluid passageway, said passageways being adapted for connection to a fluid pressure sink, said plurality of fluid ports including at

least one intermediate fluid port and two outermost fluid ports on either side of said intermediate fluid port;

(b) piston means slidably received in said chamber, said piston means including seal means located around the periphery thereof and in generally sealing engagement with said outlet fluid passageways;

(c) inlet means for communicating fluid pressure into said chamber on opposite sides of said piston seal means;

(d) valve means disposed in each of at least three of said passageways, said valve means each having a valve member adapted for selective actuation and movable between a normally closed position in which said passageway is isolated from said fluid outlet port and an open position in which said passageway communicates with said fluid outlet port, said valve means in said open position permitting fluid in said passageway to escape therefrom at a flow



rate substantially greater than said inlet port means permits fluid to enter said passageway, said piston means movable upon actuation of one of said valve means to a position in which said seal means straddles said outlet port and substantially prevents further fluid flow to said outlet passageway;

(e) said inlet means is defined by a vent passage in each of said valve members, said valve means in fluid communication with said outermost fluid ports, said vent passage closed upon said valve means being actuated to said open position; and

(f) check valve means disposed intermediate said valve means and said at least one intermediate fluid port, said check valve means preventing atmospheric air from venting into said passageway through said intermediate fluid port.

4,346,730

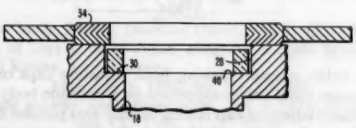
VALVE FOR ABRASIVE MATERIAL

Harold S. Gardner, Turtle Creek, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 14, 1981, Ser. No. 224,870

Int. Cl.³ F16L *7/00*

U.S. Cl. 137—375 **7 Claims**



1. An improved ball valve assembly for use in controlling the flow of an erosive fluid, said ball valve assembly of the type wherein a ball having an aperture therethrough is disposed within a housing having a first circular bore therethrough from an outer surface of said housing to another outer surface, said ball being movable between a first position wherein said aperture is aligned with said first bore so as to allow flow through said valve, and a second position wherein said aperture is out of alignment with said first bore so as to preclude flow through said valve, the improvement comprising:

a second circular bore, concentric with and of larger diameter than said first bore, extending from one of said surfaces partially into said housing so as to form an annular ledge within said housing; and

an annular deflector for reducing internal erosion of said ball valve assembly, disposed against said ledge, having an outside diameter smaller than the diameter of said second bore and an inside diameter equal to or greater than the diameter of said first bore.

4,346,731

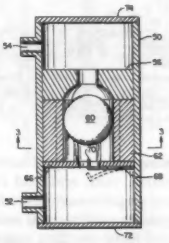
BUOYANT ELEMENT CHECK VALVE FOR A THERMOSIPHON ENERGY SYSTEM

Harry W. Sigworth, Jr., Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 26, 1981, Ser. No. 267,130

Int. Cl.³ F16K *31/22*; G05D *23/00*

U.S. Cl. 137—433 **7 Claims**



1. A valve for regulating the flow of fluid which comprises:

a single housing having a lower fluid port and an upper fluid port;

a primary valve seat interposed in said housing between said ports;

a secondary valve seat interposed in said housing between said ports below said primary valve seat;

a valve member movably disposed in said housing between said primary and said secondary valve seats which has a density less than the fluid at or below the specified normal operating temperature and a density greater than the fluid above the specified normal operating temperature, which valve member will sealingly engage the primary valve seat to prevent the upward flow of fluid if the operating temperature is at or below the specified normal operating temperature, and which valve member will disengage from the primary valve seat and occupy intermediate positions between said valve seats to permit the downward flow of fluid and said valve member will engage the secondary valve seat to prevent said downward flow of fluid if the operating temperature is above the specified normal operating temperature.

4,346,732

PRESSURE REGULATOR FOR GASEOUS AND LIQUID FLUIDS

Kurt Moos, Wil, Switzerland, assignor to Gema AG Apparatebau, Switzerland

Filed Nov. 13, 1979, Ser. No. 93,638

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1978, 2849265

Int. Cl.³ F16K *31/365*

U.S. Cl. 137—489 **15 Claims**

1. A pressure regulator for gaseous and liquid fluids comprising:

a main valve having an inlet and an outlet for a fluid, and

having a main valve body movable in a first direction to increase and in a second direction to lessen flow from said inlet to said outlet;

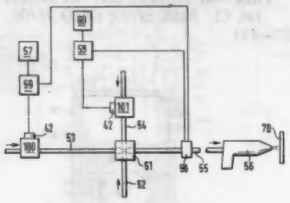
means defining a control pressure space, said control pressure space communicating with said inlet;

a control valve for controlling the pressure in said control pressure space, said control pressure space communicating via said control valve with a first vent;

force-exerting means for exerting a force in said first direction on said main valve body and being exposed to and responsive to fluid pressure in said control pressure space;

means for establishing a desired value for the fluid pressure in said outlet by controlling the fluid pressure in said control pressure space responsive to the desired value by controlling the degree of closure of said control valve; and

means defining a feedback pressure space for exerting pressure on said force-exerting means proportional to the fluid pressure in said outlet and opposed to the pressure on said force exerting means in said control pressure space, said



feedback pressure space being connected with said outlet and with a second vent; and said force-exerting means thereby exerting on said main valve body a force proportional to the pressure differential between said opposing pressures on said force-exerting means;

a cylindrical volume disposed between and communicating with said inlet, said outlet, and said feedback pressure space; said main valve body comprising a piston accomodated in said cylindrical volume; said piston having a cross-sectional area which is exposed to the fluid pressure in said inlet; said main valve body further comprising a valve closure element that communicates with said inlet and is urgeable in said first direction by fluid pressure in said inlet;

said main valve comprising first means for exposing a first cross-sectional area of said valve closure element to the fluid pressure in said inlet and second means for exposing a larger cross-sectional area of said piston than said first cross-sectional area to the fluid pressure in said inlet.

4,346,733

CONTROL VALVE

Frederick G. Grawunde, Painesville, Ohio, assignor to Fluid Controls, Inc., Mentor, Ohio

Filed Jul. 29, 1980, Ser. No. 173,436

Int. Cl.³ F16K *17/38*

U.S. Cl. 137—493 **7 Claims**

6. A control valve usable as a sequence valve or a pilot assisted, pressure relieving valve, comprising:

(a) a valve body defining a multi-stepped bore and spaced, first and second ports communicating with said bore;

(b) an elongate valve member comprising at least two spaced annuli joined by a reduced diameter portion, said annuli supported within said bore for reciprocating, axial motion;

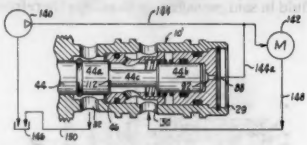
(c) one of said annuli defining a poppet valve portion and another of said annuli defining a piston portion and the one annulus being diametrically greater than the other annulus;

(d) a combination valve seat and check valve guided for reciprocating motion by said valve body bore and positioned in coaxial alignment with said valve member;

(e) said seat including an annular, internal beveled portion defining a seat surface engageable with a peripheral seating surface defined on said poppet valve portion of said valve member;

(f) spring biasing means housed within an atmospherically vented chamber defined at least partially by said valve body, urging said valve member towards engagement with said movable valve seat;

(g) stop means disposed in said vented chamber for limiting the maximum extension of said spring biasing means, whereby a biasing force applied to said valve member by said spring biasing means is substantially reduced when said valve member is engaging said movable valve seat;



(h) said one annulus defining a radial surface forming an effective pressure area exposed to fluid pressure near said first port, said fluid pressure applied to said radial surface rendering said spring biasing means at least partially ineffectual;

(i) said other annulus including an end surface that defines an effective pressure area against which a pilot pressure can be applied to further oppose said spring biasing means; and,

(j) sealing means mounted to said one annulus and sealingly engaging a portion of said valve body bore and operative to inhibit fluid leakage into said chamber.

4,346,734

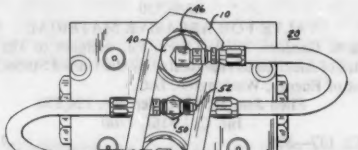
LOCKING DEVICE

John H. Frank, New Philadelphia, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Nov. 3, 1980, Ser. No. 203,087

Int. Cl.³ F16K *17/06*

U.S. Cl. 137—506 **5 Claims**



4. A valve assembly having head adjusting caps on two spaced apart relief valves supported on a common body, with each headed adjusting cap having at least two parallel spaced apart flat surfaces formed thereon, the improvement comprises:

a keeper formed from a thin sheet metal plate, having an elongated opening formed therein with a length great enough to fit over the formed adjusting head and a width slightly greater than the separation between the spaced apart flat surface on the adjusting heads, being bent along the longitudinal axis of the keeper to decrease the width of the opening formed therein and placed over the adjusting

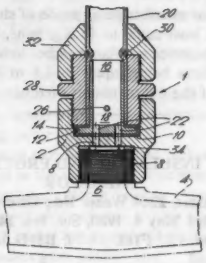
caps in engagement with the flat surfaces to prevent relative movement.

4,346,735

WATER FAUCET AND ATTACHMENT THEREFOR

Zeev Raz, Beersheva, Israel, assignor to Ben-Gurion University of the Negev, Israel, a part interest

Filed Oct. 26, 1979, Ser. No. 88,509
Claims priority, application Israel, Nov. 6, 1978, 55884
Int. Cl.³ F16K *19/00*
U.S. Cl. 137—606 8 Claims



1. A water saving faucet particularly for kitchen sinks and bathroom basins, having at least one water valve, comprising:

a single-conduit spout having an inlet end and mounted for substantially unlimited sink-sweeping movement about a sweep axis as well as for tilting movement about a tilt axis, the axes being different but intersecting;

a mechanically operated spout valve located adjacent to the inlet end of said spout, having means for blocking and opening a waterflow path between the at least one water valve and said spout; and

means mechanically linking said blocking means to said spout, tilting movements of said spout positively moving said blocking means into and out of said waterflow path, providing a first range of selectable tilt positions which provide a continuous range of selectable waterflow rates through the spout from shut-off to maximum at any pre-adjusted temperature, and providing at least one other continuous range of selectable spout positions in which said blocking means are moved to block said waterflow path, control of the waterflow rate in both the first and the at least one other continuous ranges of selectable tilt positions, due to tilting movements about the tilt axis, being completely independent of said sink-sweeping movements about the sweep axis, whereby waterflow rates, including shutoff, and water temperature remain unchanged during sink-sweeping movement.

4,346,736

ELECTRICALLY OPERATED FLUID CONTROL VALVE UNIT

Masami Inada, Kariya; Takeharu Ohumi, and Kenji Hashimoto, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jan. 9, 1980, Ser. No. 110,560
Claims priority, application Japan, Jan. 9, 1979, 54/1850
Int. Cl.³ F16K *11/07, 31/08*
U.S. Cl. 137—625.48 7 Claims

6. An electrically operated fluid control valve unit comprising:

a housing having inlet and outlet ports;

a longitudinal tubular core of magnetic material secured within said housing in an axial direction and having an axial hole to permit the flow therethrough of fluid between said inlet and outlet ports;

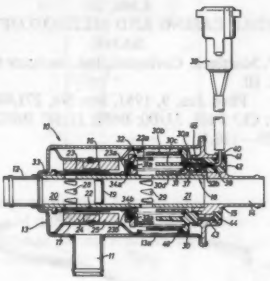
a bobbin of non-magnetic material axially slidable on said tubular core for controlling the opening area of said axial hole;

a support member of magnetic material secured within said housing and being in surrounding relationship with said tubular core;

a permanent magnet secured to said support member for providing magnetic flux in the form of a closed-loop through said support member and said tubular core;

a moving-coil wound on said bobbin across the magnetic flux of said permanent magnet for providing a linear force on said bobbin;

a pair of coil springs assembled within said housing concentrically with said tubular core, said coil springs connecting said moving-coil to an electric control circuit and biasing said bobbin to normally close said axial hole of said tubu-



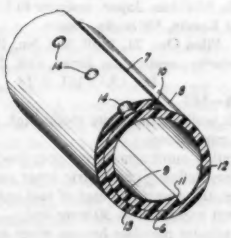
lar core; and means for insulating said springs from each other and from said housing and tubular core wherein said housing is provided with an inlet port in the form of a radial port and at its opposite ends with first and second outlet ports respectively in the form of an axial port, and said tubular core is secured at its opposite ends to said first and second outlet ports and provided with an internal partition member to subdivide the interior of said tubular core into first and second chambers respectively, said tubular core being provided with a first axial hole to permit the flow of fluid from said inlet port into said first chamber and a second axial hole to permit the flow of fluid from said inlet port into said second chamber, and wherein said bobbin is biased by said springs to normally close said first axial hole and to open said second axial hole.

4,346,737

DRIP IRRIGATION TUBING

Robert J. Miller, Five Points, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Nov. 15, 1979, Ser. No. 94,805
Int. Cl.³ B05B *15/00*
U.S. Cl. 138—42 2 Claims



1. A method of forming a drip irrigation tube comprising the

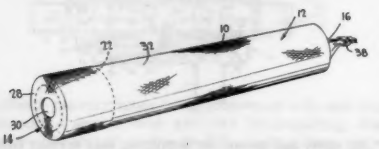
steps of providing a longitudinally elongated planar sheet of flexible material having parallel first and second longitudinal side edges, and a longitudinally extending series of holes defined therethrough parallel to said first side edge and in adjacent spaced relation thereto, transversely spiralling said sheet of flexible material on itself to define a longitudinally extending conduit of approximate circular transverse cross-section, the portion of the sheet of flexible material adjacent second side edge being positioned interiorly of the formed conduit in underlying relation to said first side edge and extending in underlying relation to the defined series of holes and for a substantial distance therebeyond to define a freely positioned flap within the formed conduit, and directly sealing said first side edge to the immediately underlying portion of the formed conduit along the full length of said first edge.

4,346,738

OVERWRAP CASING AND METHOD OF APPLYING SAME

Thomas W. Martinek, Covington, Ind., assignor to Teepak, Inc., Chicago, Ill.

Filed Jun. 9, 1981, Ser. No. 271,886
Int. Cl.³ F16L *11/00*; B65B *11/00*; B65D *85/20*
U.S. Cl. 138—118.1 **23 Claims**



1. A member encased in an overwrap casing, said overwrap casing having a first end portion telescoped over one end portion of said member, said overwrap casing having a radially inwardly transversely extending portion at a free end of said member one end portion, said overwrap casing being reversely folded upon itelf at an inner end of said radially inwardly transversely extending portion to define a radially outwardly transversely extending portion, said overwrap casing having a body portion extending the full length of said member in telescoped relation to both said overwrap casing first end portion and said member, and said overwrap casing being closed at the other end of said member.

14. A method of encasing a member, said method comprising the steps of telescoping an end portion of a tubular overwrap casing over one end portion of a member, necking down the overwrap casing adjcent the one end of the member and radially inwardly and radially outwardly folding the overwrap casing at the member one end, telescoping a body portion of the overwrap casing over the overwrap casing one end portion and the entire length of the member, and closing the overwrap casing at the opposite end of the member.

4,346,739

COMPOSITE METAL TUBING

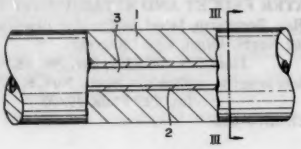
Kikuo Asada, Mishima, Japan, assignor to Usui Kokusai Sangyo Kabushiki Kaisha, Shizuoka, Japan

Filed Oct. 21, 1980, Ser. No. 199,290
Claims priority, application Japan, Oct. 24, 1979, 54-137407
Int. Cl.³ F16L *9/14*
U.S. Cl. 138—143 **3 Claims**

1. A thick walled composite metal high pressure fuel injection tubing comprising:

a thick walled outer tubular member having inner and outer diameters defining concentric inner and outer cylindrical surfaces, the outer diameter of said outer tubular member being not greater than 30 mm; and

an inner tubular member having inner and outer diameters defining inner and outer cylindrical surfaces, the outer diameter of the inner tubular member being substantially equal to the inner diameter of the outer tubular member, the inner tubular member being press-fitted into the outer tubular member such that the inner tubular member outer surface abuts the outer tubular member inner surface, the



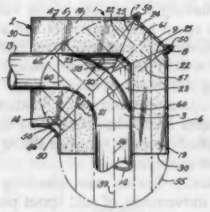
inner tubular member being made of steel having a tensile strength at least equal to 48 Kg/mm², the radial distance between the inner tubular member inner and outer cylindrical surfaces being equal to 1.5 to 8.5% of the outer diameter of the outer tubular member.

4,346,740

PIPE ELBOW INSULATOR AND PROTECTIVE JACKET THEREFOR

Robert O. Williams, 2264 Weber Rd., Gladwin, Mich. 48624

Filed May 9, 1980, Ser. No. 148,529
Int. Cl.³ F16L *59/14*; B21D *53/00*
U.S. Cl. 138—149 **7 Claims**



1. A throatless insulator for pipe elbows, and the like, comprising:

an insulative insert, including:

first and second insulator legs, each having an interior channel shaped to respectively receive therein first and second pipe sections interconnected by an elbow;

said first and second insulator legs each having a dihedral face adapted for orientation toward each other at a medial portion of the elbow; each dihedral face including inner and outer surfaces which intersect at the central axis of said associated leg; said inner surfaces being inclined at an angle substantially equal to one-half of the included angle between said pipe sections, and abutting during an assembled condition; said outer surfaces being inclined from an associated one of the inner surfaces at an angle substantially equal to one-quarter of the included angle;

a wedge-shaped insulator gore disposed between said outer surfaces, with end faces inclined to mate with the same and form an insulative enclosure about the elbow; and

a protective jacket, including:

first and second jacket legs having a tubular shape and receiving therein said first and second insulator legs respectively; said jacket legs each having an inclined interior end oriented toward each other at a medial portion of the jacket; said first and second jacket legs being spaced apart during an assembled condition, so as to form a gap between the interior ends thereof;

a jacket gore extending between and completely about the interior ends of said legs, and overlying said insulator gore to close said gap;

means for connecting the interior ends of said jacket legs

with said jacket gore to form a protective shell enveloping said insulative insert.

3. A method for fabricating a protective jacket for pipe elbow insulators, comprising:

providing an insulative insert having first and second insulator legs with a wedge-shaped insulator gore positioned between inclined outer surfaces of the insulator legs;

forming first and second sleeve-shaped jacket legs from sheet material; said jacket legs having interior ends cut along mutually inclined, predetermined planes, and being spaced apart during an assembled condition to form a gap therebetween;

forming a jacket gore shaped to extend continuously about the periphery of said gap, and close the same; said jacket forming step including:

sizing a narrowest throat portion of said jacket gore between ¾ and 1 inch;

sizing a widest, heel portion of said jacket gore to a width substantially equal to the furthest distance between said insulator leg outer surfaces;

shaping opposing side edges of said jacket gore in a manner such that in the assembled condition said side edges lie along inclined planes which extend respectively from associated sides of said throat and heel portions; said inclined jacket leg planes substantially coextensive with said jacket gore planes; and

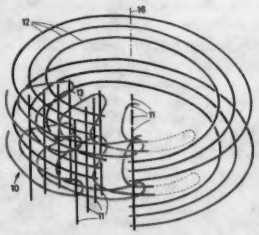
assembling said jacket legs and gore about said insulative insert to form a protective shall enveloping the same.

4,346,741

THREE-DIMENSIONAL WOVEN ARTICLES

Jean Banos, Merignac; Jean-Claude Cantagrel, Saint Aubin de Medoc; Georges Cahuzac, and Jean-Louis Darrieux, both of Merignac, all of France, assignors to Societe Nationale Industrielle et Aerospatiale, Paris, France

Division of Ser. No. 916,554, Jun. 19, 1978, Pat. No. 4,183,232.
This application Dec. 7, 1979, Ser. No. 101,225
Claims priority, application Sweden, Jun. 20, 1977, 7718831
Int. Cl.³ D03D *3/02*
U.S. Cl. 139—387 R **10 Claims**



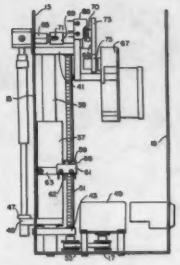
1. A woven reinforced article formed as a hollow body of revolution having a thick wall formed by three-dimensional weaving comprising a triple set of rods and yarns comprising a plurality of rod-bunches circumferentially arranged about a central axis, each rod bunch having a plurality of elongated rods spaced along a common radius and respectively lying in circumferentially spaced relation to the corresponding rod in the adjacent rod bunch, a first substantially continuous yarn located to be between each of the adjacent radially-spaced rods forming superimposed courses of helically wound yarn; a second yarn extending radially between adjacent circumferentially spaced rod bunches intermediate each of said courses and being chain stitched to enclose the radially-spaced rods of each rod bunch between each of said courses of helically wound yarn.

4,346,742

METHOD FOR DILUTING A LIQUID TFST SAMPLE AND COMPUTER CONTROLLD DILUTING APPARATUS

Charles Chase, Elk Groove; Stephen Walters, Citrus Heights, and Richard E. Meador, Sacramento, all of Calif., assignors to P.M. America, Inc., Sacramento, Calif.

Filed Jun. 2, 1980, Ser. No. 155,472
Int. Cl.³ B65B *3/32*
U.S. Cl. 141—1 **9 Claims**



1. A computer controlled diluting apparatus for the automated pick-up and delivery of a liquid test sample and diluent therefor by a syringe having a barrel, barrel tip, and plunger, said apparatus comprising

a housing,

a computer controlled syringe plunger drive means including a zero volume switch means,

computer controlled valve means mounted to said housing, said valve means having a first branch port adapted to be connected to a diluent pick-up line, a second branch port adapted to be connected to a sample pick-up line, and a distribution port which can be switched into fluid communication with either said first or second branch ports, said distribution port being adapted to releasably secure the barrel tip of a syringe, and

computer control means for sequencing said plunger drive means and said syringe barrel valve means to:

(a) pick up diluent through said diluent pick-up line to fill a preset volume of said syringe barrel,

(b) pick up sample in said sample pick-up line to fill and additional volume of said syringe barrel, and

(c) deliver sample and diluent through said sample pick-up line.

4,346,743

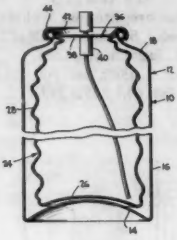
PRODUCT BAG FOR AEROSOL CONTAINER AND METHOD OF UTILIZING THE SAME TO FACILITATE FILLING WITH PROPELLANT

Teddy Miller, Skokie, Ill., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Dec. 19, 1980, Ser. No. 218,159
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—3 **12 Claims**

11. A method of filling an aerosol container with a propellant wherein said aerosol container is of the type including a product bag, said method comprising the step of providing a container having an upper portion terminating in a container flange defining an opening, providing a product bag having a neck terminating in an annular flange, placing the product bag in the container with the neck extending out through the container opening and the annular flange overlying in axially spaced relation the container flange, placing a valve cup on the product bag with a sealing flange of the valve cup engaging the annular flange, pressing the valve cup down to temporarily seat the annular flange on the container flange and bonding the annular flange to the sealing flange, releasing the valve cup with the product bag pushing the valve cup upwardly and

spacing the annular flange above the container flange, and then directing a propellant into the container between the container



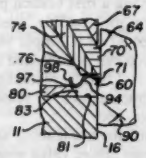
flange and the annular flange and then through the opening around the product bag neck.

4,346,744

WOOD WAFERIZING APPARATUS

Douglas C. Beer, Seattle, Wash., and Horst J. Jatzek, Coquitlam, Canada, assignors to CAE Machinery Ltd., Vancouver, Canada

Filed Aug. 22, 1980, Ser. No. 180,257
Int. Cl.³ B27C 1/14
U.S. Cl. 144—176 10 Claims



1. Apparatus for cutting long and thin wafers of controlled width by slicing pieces of wood along the grain thereof, comprising

a rotatable carrier element having a work surface which moves when the element is rotated around an axis,

spaced elongate and narrow slots through the carrier element, each having an entrance opening out from said work surface,

feed means for directing longitudinal sides of pieces of wood against the work surface with said sides and the grain of the wood pieces extending substantially parallel to the slots when the latter pass the wood during movement of the carrier element, and

a waferizing arrangement in each slot, each waferizing arrangement comprising

a cutter knife mounted on the carrier element at one side of one of said slots and extending longitudinally thereof, said knife having a cutting edge protruding slightly through the entrance of its slot and from the work surface to cut slices of a predetermined thickness off the sides of the wood pieces bearing against the work surface, and

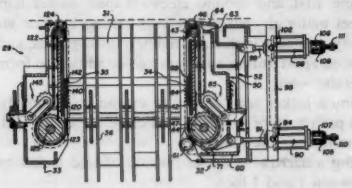
a reactor guide means on an opposite side of said slot and having a surface opposite the knife cutting edge but spaced inwardly therefrom and from the entrance of the slot a distance only sufficient to be engaged by slices which are directed thereagainst by the knife to break said slices longitudinally thereof into wafers substantially of a predetermined width.

4,346,745

WAFER SLICING APPARATUS

Jack Weavell, and Horst J. Jatzek, both of Coquitlam, Canada, assignors to CAE Machinery Ltd., Vancouver, Canada

Filed Aug. 25, 1980, Ser. No. 181,314
Int. Cl.³ B27C 1/14
U.S. Cl. 144—176 14 Claims



1. Apparatus for slicing from longitudinal sides of elongate wood pieces having grain running substantially from end to end thereof, relatively long and thin wafers with longitudinally extending grain, said apparatus comprising

a carrier rotatable around a central axis and having a work face,

a plurality of cutter knives arranged on the carrier and protruding from the face thereof sufficiently to cut wafers of a substantially predetermined thickness and length during rotation of the carrier,

a feed passage positioned to direct longitudinal sides of wood pieces against said carrier face to enable the knives thereof to slice wafers from the pieces during rotation of the carrier, said feed passage being defined by opposed first and second side walls each side wall having an inner end adjacent the carrier and an outer end remote from the inner end,

feed means forming part of each side wall for gripping the ends of wood pieces and moving said pieces along the passage and against the carrier face, and

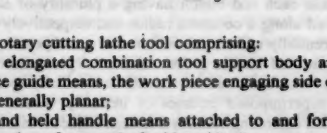
support means for at least the feed means of the first side wall for maintaining the feed means in floating relationship relative to the feed means of the second side wall and resiliently permitting limited movement towards and away from the second wall feed means and permitting the ends of the first side wall to be moved independently of each other to accommodate pieces of different lengths in the feed passage at the same time.

4,346,746

ROTARY CUTTER LATHE TOOL

Louis M. Busch, 74 Cherry La., Macungie, Pa. 18062

Filed Aug. 11, 1980, Ser. No. 176,761
Int. Cl.³ B27F 1/08
U.S. Cl. 145—115 3 Claims



1. A rotary cutting lathe tool comprising:

(a) an elongated combination tool support body and work piece guide means, the work piece engaging side of which is generally planar;

(b) hand held handle means attached to and forming an extension of one end of said tool body;

(c) bearing means mounted at a right angle on said tool body from said planar side intermittent said tool support ends, the portion of said tool body extending from said bearing

to said tool body other end forming said work piece guide means;

(d) a concavo-concave shaped collar including a generally planar top and bottom journalled on said bearing; and,

(e) a frustum-shaped blade rotatably mounted transversely on said bearing above said collar, said blade, collar and guide means forming a die for the circular shaping of a lathe held, and turning, work piece.

4,346,747

RUN-FLAT SUPPORT AND TIRE ASSEMBLY

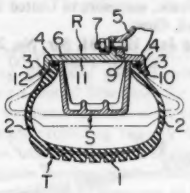
Isao Osada, Izumi, and Shoichi Sano, Tokorozawa, both of Japan, assignors to Ohtsu Tire & Rubber Co., Ltd., Osaka and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Continuation of Ser. No. 2,749, Jan. 11, 1979, abandoned. This application Aug. 29, 1980, Ser. No. 183,561

Claims priority, application Japan, Jan. 19, 1978, 53-4582

Int. Cl.[3] B60C *17/04*

U.S. Cl. 152—158 5 Claims



1. A run-flat support and tire assembly for use with a tubeless tire comprising: a split rim divided into at least two sections in an axial direction of the wheel; annular flange portions of said rim formed on the opposite sides thereof and a base portion formed therebetween; a tubeless tire mounted on said split rim and having annular bead portions formed on the opposite sides thereof; a plurality of circumferentially divided circular support members each having an inner peripheral surface thereof fitted over said base portion within an air chamber surrounded by said tubeless tire and said rim for cooperating with said flange portions to prevent displacement of said bead portions of said tubeless tire and to firmly support the tread portion of said tire when air sealed within said tire is lost; each of said support members comprising a thin-wall casing body having its inner peripheral surface formed open; said support members being further defined as trapezoid in cross section, having a radially outer peripheral wall smaller in lateral width than the opened inner peripheral surface, reinforcing ribs extending from the inner surface of said casing body to partition the interior of said casing body into a plurality of chambers; and connecting protrusions projecting circumferentially from opposite end surfaces of said casing body, said connecting protrusions at the adjacent ends of said support members being closely engaged with each other in male and female relationship and pivotally connected at their inner peripheries with each other by means of a plurality of connecting pins which extend laterally in an axial direction and being clamped between said bead portions of said tubeless tire, each of said support members having a radial height greater than that of said tire bead portions.

4,346,748

TRACTION DEVICE FOR VEHICLES

John P. Bagoy, and Joseph A. Riendl, both of 1730 W. 10th Pl., #4, Tempe, Ariz. 85281

Filed Jan. 12, 1981, Ser. No. 224,074

Int. Cl.[3] B60C *27/00, 11/00*

U.S. Cl. 152—222 9 Claims

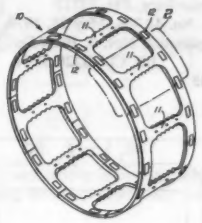
1. A wheel mountable device for increasing the traction of a tire on a road surface comprising:

a plurality of traction elements secured together in an endless chain,

said elements comprising a plastic body each having an elongated traction member having generally planar inner and outer surfaces for extending laterally across the width of the tire and a pair of fastening members formed to extend laterally one across each end of said traction member,

each of said fastening members being arcuate in shape to fit around and conform to sidewalls of the tire,

means for detachably mounting at least one stud of wear resistant material to at least one traction member of at least one of said elements,



said means comprising a bracket for wrapping around a part of said inner surface of said traction member,

said stud being secured to said bracket for extending through said traction member laterally thereof and outwardly of its outer surface, and

fastening means attached to said fastening members of said traction members for releasably securing said traction elements in an endless chain for mounting around the circumference of a tire,

whereby the inner surfaces of said traction members abut the outer periphery of the tire such that as the tire rolls along a road surface the traction members contact the road surface with the stud providing added traction for the tire.

4,346,749

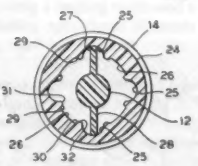
MOTOR AND ROLLER SUPPORT FOR WINDOW SHADES AND THE LIKE

Buckley A. Singletary, Plainfield, and John C. Gall, Chicago, both of Ill., assignors to Sears, Roebuck and Company, Chicago, Ill.

Filed Aug. 18, 1980, Ser. No. 179,323

Int. Cl.[3] E06B *9/208*

U.S. Cl. 160—301 24 Claims



1. An improved reversible locking clutch apparatus comprising

a housing including an annular portion having a plurality of alternately deep and shallow recesses formed in the inner surface of the periphery of said portion, and

a spindle having at least one flexible pawl extending therefrom and positioned to cooperate with the plurality of recesses of the annular portion of said housing, said pawl being unflexed when radially aligned with any of said

deep recesses in the inner surface of the annular portion of said housing whereby relative rotation between the housing and said spindle can be initiated in either direction therefrom, and said pawl being angularly flexed upon being positioned in any of said shallow recesses in the inner surface of the annular portion of said housing and abutting the recess surface when the end of said pawl resides in said recess, whereby relative rotation between said housing and said spindle can be initiated in only one direction therefrom.

4,346,750

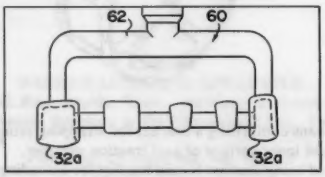
METHOD OF MAKING DENTAL BRIDGE USING A PREFABRICATED NON-PRECIOUS PONTIC

Mike Z. Nemethy, Royal Dental Lab., Inc., 3869 5th Ave. North, St. Petersburg, Fla. 33713

Division of Ser. No. 42,708, May 25, 1979, Pat. No. 4,269,595. This application Nov. 5, 1980, Ser. No. 206,292

Int. Cl.³ B22C 9/04

U.S. Cl. 164—35 **4 Claims**



1. A method of making dental bridges wherein at least a pair of opposed wax copings, formed by at least a pair of opposed abutment dies, are subsequently invested and cast into precious alloy copings, the improvement comprising the steps of:

providing a prefabricated pontic framework of non-precious metal having at least one pontic support with a pair of connecting bars extending therefrom;

cutting the connecting bars to a desired length to fit between the abutment dies of said pair of opposed abutment dies;

attaching one of the connecting bars to each of the wax copings of said pair of opposed wax copings;

investing the pair of opposed wax copings with the prefabricated pontic framework disposed therebetween.

4,346,751

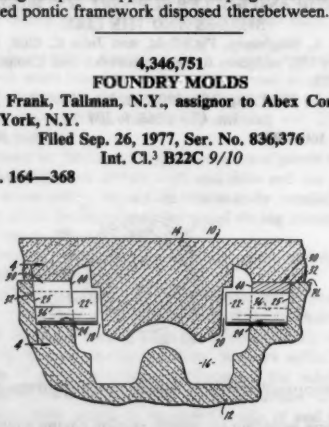
FOUNDRY MOLDS

Earl E. Frank, Tallman, N.Y., assignor to Abex Corporation, New York, N.Y.

Filed Sep. 26, 1977, Ser. No. 836,376

Int. Cl.³ B22C 9/10

U.S. Cl. 164—368 **1 Claim**



1. A sand mold drag having opposed side walls separated by a casting cavity, each side wall of the drag having an upper parting line surface with a plurality of core receiving recesses extending downwardly therefrom, each recess presenting a bottom pocket of sand for receiving the core and also presenting a pair of sand shoulders outward of and in communication with said pocket on opposite sides thereof for supporting a cover, each recess having one end opening into the casting cavity, the core resting in said pocket and only partially filling the remainder of the related recess so that said shoulders are free of the core, and a one-piece pre-molded cover set atop and in contact with each core with a pair of spaced bottom ledges of the cover resting on said shoulders substantially to fill the remainder of each drag recess, each cover having an underside concave recess fitting the top of the related core and having a flat top surface flush with the parting line surface of the related mold side wall, wherein said concave recess in each cover is tapered from a narrow width at the end adjacent the casting cavity to a wider width at the opposite end.

4,346,752

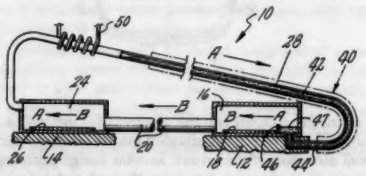
SELF-DRIVEN CHEMICAL HEAT PIPE

Arthur S. Kesten, West Hartford, and Alan F. Haught, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 19, 1981, Ser. No. 226,320

Int. Cl.³ F28D 21/00

U.S. Cl. 165—1 **29 Claims**



1. In a chemical heat pipe employing reversible endothermic/exothermic chemical reactions to transfer heat a relatively long distance between a heat source and a heat sink and including a closed circuit flow path in heat transfer relation with a heat source and with a heat sink at respective heat source and heat sink positions along said path, said closed circuit flow path including separate first and second arms each extending between said heat source and heat sink positions, and a chemical reactant being contained within said closed circuit flow path, the method of self-driving said reactant substantially unidirectionally around said closed circuit flow path comprising the steps of:

providing a supply of said reactant in said flow path for reaction at said heat source position;

endothermically reacting at said heat source position said reactant from said supply thereby to create gaseous reaction product at sufficient pressure relative to the pressure at said heat sink position, for establishing flow of said reaction product toward said heat sink position and to enhance transport of said reactant from said supply to said heat source position;

exothermically reacting said reaction product at said heat sink position to reform said reactant in a gaseous state; and

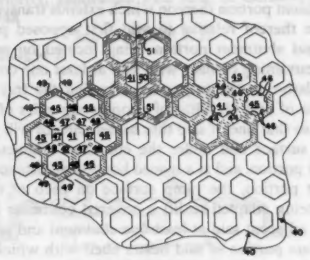
converting said reformed reactant to a liquid form and passively conducting said liquid-form reactant toward said heat source position such that it fully occludes at least a portion of said second arm and provides said reactant supply, said occlusion of said second arm by said liquid-form reactant thereby substantially preventing liquid revaporization into an otherwise counterflowing gaseous reaction product and permitting sufficient pressure difference between said heat source and said heat sink positions to establish and promote the flow of said gaseous reaction product to said heat sink position through said first arm.

4,346,753

REGENERATOR CHECKERWORK BRICK

Stanley J. Kletch, Bridgeville, Pa., assignor to Bricmont & Associates, Inc., McMurray, Pa.

Filed Jan. 6, 1981, Ser. No. 223,071
Int. Cl.³ F28D *17/02*
U.S. Cl. 165—9.1 **5 Claims**



1. Checkerwork bricks for a regenerator, each checkerbrick essentially including generally parallel internal planar wall sections surrounding a central flow space for conducting a heat exchange medium between opposite sides of the brick, partitioning wall segments projecting radially from said internal planar wall sections, said internal wall sections and said partitioning wall segments having substantially uniform thicknesses, and planar exterior wall segments of hexagonal configuration joined so that every three planar exterior wall segments form a flow space between each of adjacent ones of said internal wall sections to thereby form an array of outer flow spaces distributed uniformly about said central flow space, the thickness of said planar exterior wall segments being uniform and equal to about one-half the thickness of said internal wall sections so that each exterior wall segment of one brick can abut with a similar external wall segment of another brick to define an effective heat storage capacity of the two abutting walls substantially equal to the heat storage capacity of an internal planar wall section, each planar exterior wall segment being arranged to abut with an external wall segment of another brick for uniform heating or cooling of the mass of the brick by the flow of a heat transfer medium only along said central flow space and said outer flow spaces.

4,346,754

HEATING AND COOLING SYSTEM

Leland A. Imig, Goehner, Nebr., and Mickey R. Gardner, Gloucester Point, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 30, 1980, Ser. No. 145,208
Int. Cl.³ F25B *29/00*
U.S. Cl. 374—46 **9 Claims**

1. A device for heating and cooling a specimen undergoing fatigue testing comprising:

a fatigue testing machine;

a test specimen connected to said fatigue testing machine;

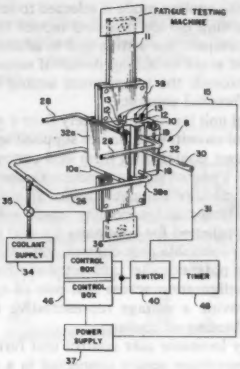
block means having a small mass to enable rapid cooling and heating thereof;

said block means being constructed and arranged to engage said test specimen;

clamping means for securing said block means to said test specimen;

cooling means for cooling said block means and test specimen to very cold temperatures;

heating means for heating said block means and test specimen to very hot temperatures; and



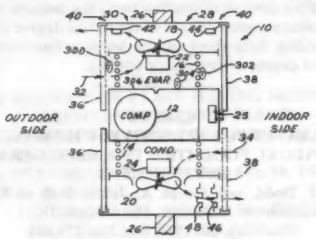
contol means for selectively activating said heating means and said cooling means to selectively heat and cool said test specimen.

4,346,755

TWO STAGE CONTROL CIRCUIT FOR REVERSIBLE AIR CYCLE HEAT PUMP

Robert P. Alley, Onondaga, N.Y.; Walter J. Pohl, Louisville, Ky., and John W. Relyea, Onondaga, N.Y., assignors to General Electric Company, Louisville, Ky.

Filed May 21, 1980, Ser. No. 151,855
Int. Cl.³ F25B *29/00*
U.S. Cl. 165—17 **25 Claims**



1. A two stage control circuit for a reversible air conditioning unit of the type having a heating mode and a cooling mode of operation and including operational elements for providing first and second stages of heating and cooling, said control circuit comprising:

a mode switch for making predetermined electrical connections depending upon whether heating mode or cooling mode operation is selected;

a first stage controlled switching device connected, when activated, to energize the first stage operational elements;

a second stage controlled switching device connected, when activated, to energize the second state operational elements;

thermostatic control circuitry for comparing sensed indoor temperat re with a temperature setting and for activating said first and second stage controlled switching devices depending upon the difference between sensed indoor temperature and the temperature setting, said thermostatic control circuitry operable when the heating mode is selected to activate said first stage switching device if sensed

indoor temperature is below the temperature setting and to additionally activate said second stage switching device if sensed indoor temperature is below the temperature setting by a predetermined differential amount, and operable when the cooling mode is selected to activate said first stage switching device if sensed indoor temperature exceeds the temperature setting and to additionally activate said second stage switching device if sensed indoor temperature exceeds the temperature setting by a predetermined differential amount;

a user control unit locatable remotely from a main portion of said control circuit, with power supplied to said remotely locatable user control unit from said control circuit main portion via a pair of supply conductors, one of said pair of supply conductors being subdivided into a heating mode select conductor and a cooling mode select conductor alternately selected for continuity by said mode switch;

said remotely locatable user control unit having a temperature setting potentiometer connected in adjustable voltage divider configuration across said pair of supply conductors to provide a voltage representative of the desired degree of heating or cooling;

said remotely locatable user control unit further having an indoor temperature sensor connected in a circuit to provide a voltage representative of the actual degree of heating or cooling, said indoor temperature sensor circuit responsive to said heating and cooling mode select conductors to selectively cause the voltage representative of the actual degree of heating or cooling to vary either directly or inversely with sensed temperature;

a heat limiting trimmer resistor and a cool limiting trimmer resistor respectively selected in response to said heating and cooling mode select conductors and arranged in combination with said potentiometer to controllably limit user selection of the voltage representative of the desired degree of heating or cooling; and

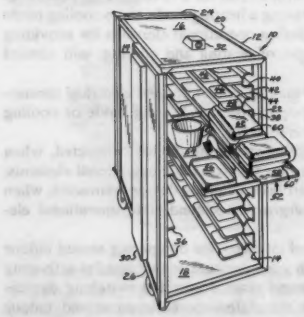
comparator circuitry responsive to the voltage representative of desired degree of heating or cooling and to the voltage representative of the actual degree of heating or cooling to activate said first and second stage controlled switching devices depending upon the amount by which the voltage representative of the actual degree of heating or cooling falls short of the voltage representative of desired degree of heating or cooling.

4,346,756

APPARATUS FOR SELECTIVELY HEATING AN INDIVIDUAL FOOD ITEM IN A REFRIGERATED ENVIRONMENT

Malcolm J. Dodd, and Joseph A. Juhas, both of Litchfield, Conn., assignors to UOP Inc., Des Plaines, Ill.

Filed Aug. 20, 1980, Ser. No. 179,858
Int. Cl.³ F25B 29/00
U.S. Cl. 165—48 R **13 Claims**



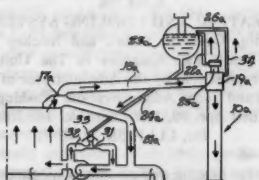
1. An apparatus for heating at least one covered container on a meal service tray while other items on the tray are refrigerated comprising an enclosed housing having a plurality of cooperative pairs of guide rail portions therein for supporting a first pair of opposed side edges of a plurality of trays; a plurality of vertically spaced, generally horizontal, thin heater shelves extending from a side wall of said housing; a ramp surface on at least one end of each of said heater shelves; a plurality of meal service trays, each of said trays having at least one abutment portion thereon which extends transversely over a portion thereof relative to said first opposed pair of side edges, said abutment portion being located on said tray to permit restraining contact with said at least one covered container relative to the tray while allowing the tray to be slid along one of said plurality of cooperating pairs of guide rail portions so that one of said thin heater shelves will pass above the tray surface and under the container contacted by said abutment portion, and at a spaced horizontal distance from said abutment portion, the ramp surface on each of said heater shelves being adapted to lift a covered container located on said tray adjacent said at least one abutment and permit a flat heater plate portion of said heater shelf with which said container is frictionally engaged to pass under said container as said container is restrained by said at least one abutment portion, said at least one container and said tray and/or said heater shelf having longitudinally extending rib and groove complementary guiding portions thereon for insuring that said at least one container will be restrained from rotational or transverse movement as said container and tray are moved relative to said heater shelf.

4,346,757

AUTOMOTIVE COOLING SYSTEM USING A NON-PRESSURIZED RESERVOIR BOTTLE

Alex S. Cheong, Mississauga, and James F. Accursi, Windsor, both of Canada, assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 10, 1980, Ser. No. 185,828
Int. Cl.³ F01P 3/00
U.S. Cl. 165—51 **6 Claims**



1. In a pressurized cooling system for an automotive vehicle including an engine coolant jacket, a radiator, a coolant pump directing fluid from the radiator to the engine coolant jacket, a surge bottle connected to an overflow line from the radiator, and a make-up line from the surge bottle to a point upstream of the pump, the improvement comprising a conduit from the pump outlet to the pump inlet, and a venturi in said conduit with the venturi throat connected to said make-up line, such that the surge bottle is maintained at atmospheric pressure.

4,346,758

HEAT EXCHANGER FOR COOLING SLAG-CONTAINING GASES FROM COAL GASIFICATION

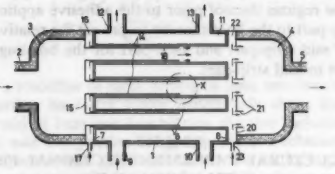
Wolfgang Kehrer, and Helmut Lachmann, both of Berlin, Fed. Rep. of Germany, assignors to Borsig GmbH, Berlin, Fed. Rep. of Germany

Filed Nov. 29, 1979, Ser. No. 98,390

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1979, 2913748

Int. Cl.³ F28F 9/22

U.S. Cl. 165—134 R 3 Claims



1. A heat exchanger, especially a tube bundle heat exchanger for cooling slag-containing gases from coal gasification in at least three streams physically to control possible solidifying of gaseous slag which would deposit internally along cold tube walls to accumulate thick thereon in a short time, which comprises in combination:

a shell, at one end of which is located a first inlet for receiving hot slag-containing gases, and an inlet chamber for receiving hot gases from said inlet, and at the other end of which is located a discharge chamber for receiving cooled-off gases, and an outlet for receiving cooled-off gases from said discharge chamber for discharge of said gases from said shell;

first tube bottoms located in said inlet chamber;

second tube bottoms located in said discharge chamber;

tubes, in the form of a tube bundle, fastened in said first and second tube bottoms and adapted to receive hot gases therethrough, said tubes extending from said inlet chamber to said discharge chamber;

a second inlet located in said shell for receiving cooler slag-free gas;

third tube bottoms located in said inlet chamber, said third tube bottoms and said first tube bottoms being spaced from one another to form a first cooler slag-free gas inlet chamber, which is in communication with said second inlet for admixing said hot and slag-free gas;

insert tubes connected to tube bottoms belonging therewith and located within tubes belonging therewith, said insert tubes having a temperature above solidification temperature of the slag and extending from the inlet side of said tubes at least partially toward the outlet side thereof, said insert tubes being spaced from tubes belonging therewith to form narrow annular spaces therebetween which communicate with said first slag-free gas inlet chamber and which are adapted to generate high discharge speed;

means for keeping warmed-up cooler slag-free gas, which discharges from said narrow annular spaces, along the inner walls of said tubes; and

means for further cooling of admixed gases discharging from said tubes.

4,346,759

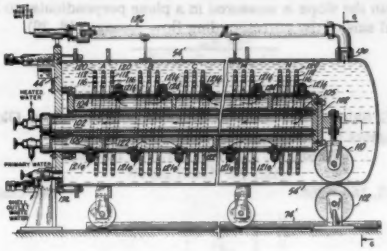
HEAT RECLAIMING SYSTEM

Kenneth W. Cohen, Harrington Park, and George P. Mansey, Hillsdale, both of N.J., assignors to Aerco International, Inc., Northvale, N.J.

Continuation-in-part of Ser. No. 894,835, Apr. 10, 1978, Pat. No. 4,256,176. This application Mar. 5, 1980, Ser. No. 127,427

Int. Cl.³ F28D 7/10

U.S. Cl. 165—163 4 Claims



1. A heat exchanger comprising duct means and shell means, said duct means providing a first space for conducting a first fluid at one temperature through said heat exchanger and said shell means enclosing said duct means so as to provide a second space therebetween for conducting a second fluid at a different temperature through said heat exchanger, said first and second spaces being isolated from each other to prevent commingling of said fluids in said heat exchanger, characterized in that said duct means comprises a plurality of coil sections through which the first fluid passes, said coil sections being arranged generally in series and being in heat transfer relation to the second fluid, each coil section comprising at least one tubular coil and means for reversing the direction of flow of the first fluid as it passes through selected ones of said coil sections and conduit means coupled to at least a selected one of the coil sections for conducting the first fluid out of the heat exchanger.

4,346,760

HEAT EXCHANGER PLATE HAVING DISTORTION RESISTANT UNIFORM PLEATS

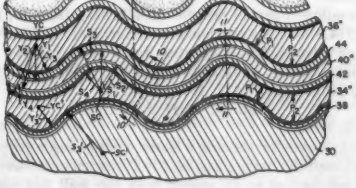
Gonzalo D. Vidal-Meza, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US81/00208, § 371 Date Feb. 18, 1981, § 102(e) Date Feb. 18, 1981

PCT Filed Feb. 18, 1981, Ser. No. 277,742

Int. Cl.³ F28F 3/08, 3/04

U.S. Cl. 165—166 14 Claims



1. A heat exchanger plate (2,4,6,8) for forming a barrier between donative recipient fluids flowing through the heat exchanger and for forming fluid flow passages (18,20) arranged to cause heat transfer through the plate from the donative fluid to the recipient fluid, said plate (2,4,6,8) including undulatory

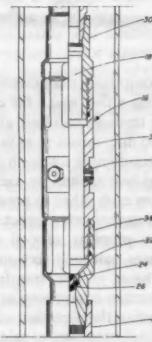
pleates (12) forming a set of donative fluid flow passages (20) on one side of said plates and a set of recipient fluid flow passages (18) on the other side of said plates interleaved with the donative fluid flow passages (20), each flow passage (18, 20) being bounded on opposite sides in plan view by the side walls (38, 42, 44) of a pleat (12) and having a central axis in plan view extending along a continuous curvilinear path between separate points on the plate perimeter, characterized in that the slope of each said side wall (38, 42, 44) of each said pleat (12) is constant along the entire length of the flow passage (18, 20), wherein the slope is measured in a plane perpendicular to the central axis of the corresponding flow passage (18, 20).

4,346,761

HYDRA-JET SLOTTING TOOL

Neal G. Skinner, and Harry A. Braswell, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Feb. 25, 1980, Ser. No. 124,009
Int. Cl.³ E21B *29/00*
U.S. Cl. 166—206 **48 Claims**



1. Apparatus for controlling the rate of tool movement in a well casing, comprising:

housing means having slip means thereon, said slip means adapted to engage said well casing;

mandrel means longitudinally slidably disposed in said housing means;

spring means adapted to bias said mandrel means against longitudinal movement; and

metering means adapted to control the rate of longitudinal movement of said mandrel means with respect to said housing means.

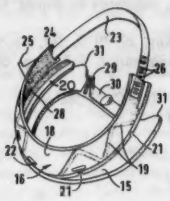
4,346,762

PLASTICS MATERIAL HORSESHOES

Igal Tovim, Millers Farm, Norwood End, Fyfield, Ongar, Essex, England

Continuation-in-part of Ser. No. 40,412, May 18, 1979, Pat. No. 4,265,314, which is a continuation of Ser. No. 777,506, Mar. 14, 1977, abandoned. This application Jul. 1, 1980, Ser. No. 165,085
Claims priority, application United Kingdom, Mar. 16, 1976, 10428/76; Sweden, Jul. 2, 1979, 7905778
Int. Cl.³ A01L *5/00, 3/00*
U.S. Cl. 168—4 **19 Claims**

1. Apparatus for shoeing a horse, comprising a strip-part of plastics material having a generally L-shaped cross-section and being pre-formed to fit against both the wall and peripheral region of the sole of a horse's hoof around the front and sides thereof, said pre-formed strip-part being adapted for adhesive application to a horse's hoof and having sufficient flexibility readily to conform closely to the configuration of the front and side walls of the hoof thereby to maximize the adhesively bonded surface contact of the strip-part with the wall of the hoof, and a pre-formed plastics material shoe-part, said shoe-part also being formed of a plastics material and being relatively inflexible as compared with the strip-part, said plastics shoe-part being pre-formed for bonding to said pre-formed strip-part after said strip has been adhesively bonded to a



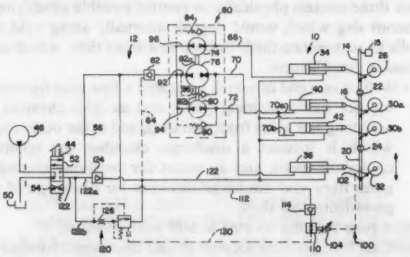
horse's hoof, said strip-part and said shoe-part being pre-united in the toe regions thereof prior to the adhesive application of said strip-part to the hoof thereby to pre-set the relative disposition of said strip-part and shoe-part for the bonding of said shoe-part to said strip-part.

4,346,763

AGRICULTURAL IMPLEMENT SECTIONAL FRAME WITH DEPTH LIMIT

William C. Swanson, Clarendon Hills, and Evert J. Heersink, Hinsdale, both of Ill., assignors to International Harvester Co., Chicago, Ill.

Filed Nov. 28, 1980, Ser. No. 210,985
Int. Cl.³ A01B *63/111*
U.S. Cl. 172—2 **8 Claims**



1. In an agricultural implement having frame sections including a main frame section and at least one flexibly attached wing frame section thereon, and a wheel assembly associated with each said frame section supporting each said frame section, a hydraulic circuit for controlling said wheel assemblies comprising:

a plurality of hydraulic cylinders, having head and rod ends, each of said plurality pivotally connected to one each of said frame sections and to one each of said wheel assemblies associated with each said frame section;

a multi-rotor rotary flow divider having one of each of said rotors for metering flow to one of each of said hydraulic cylinders;

a mechanical linkage affixed to one of said hydraulic cylinders and displaced upon displacement of said one hydraulic cylinder;

a pilot valve associated with said mechanical linkage to close upon engagement with said linkage;

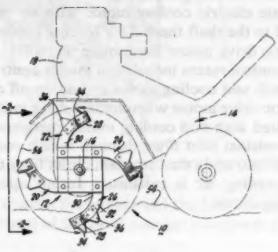
a main lowering supply flow control valve hydraulically connected to said pilot valve and hydraulically connected to said hydraulic circuit, said flow control valve terminating flow to said hydraulic cylinders when said pilot valve is closed.

4,346,764

ROTOTILLER WITH ANGULARLY DISPOSED TEETH

Joe Rossi, 2409 Soscol Ave., Napa, Calif. 94558

Filed Sep. 2, 1980, Ser. No. 183,338
Int. Cl.³ A01B 33/02
U.S. Cl. 172—42 7 Claims



1. In a rototiller of earth having at least one tine, said rototiller further having a motor driven axle about the axis of which said at least one tine rotates, the tine including a first portion, said first portion being disposed at a substantial angle with respect to said axis, said tine further including a second portion substantially angularly disposed in relation to said first portion and also with respect to said substantial angle of said first portion with respect to said axis, each of said tine portions having a first edge continuous with the first edge of the other of said tine portions, and a second edge continuous with the second edge of the other of said tine portions, said first edge of each of said tine portions being adapted for contacting the earth before said second edge of each of said tine portions during the rotation of said at least one tine, the improvement comprising:

a. a first tooth affixed to the first portion of the at least one tine, said first tooth having a dimension along the first portion of the at least one tine and extending beyond the first edge of said first portion of the at least one tine for penetration of the earth along said first tooth dimension;

b. a second tooth affixed to the second portion of the at least one tine angularly disposed in relation to the first portion of the at least one tine, said second tooth having a dimension along the second portion of the at least one tine and extending beyond the first edge of said second portion of the at least one tine for penetration of the earth along said second tooth dimension, said first and second teeth being affixed to the tine such that said earth penetrations along said first and second teeth dimensions form an angle with one another.

4,346,765

SPEED RESPONSIVE MOTOR SHUTOFF MECHANISM FOR FLUID OPERATED TOOL

William Workman, Jr., Spring Lake, Mich., assignor to Cooper Industries, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 13,486, Feb. 21, 1979, abandoned. This application May 23, 1980, Ser. No. 152,892
Int. Cl.³ B25B 23/145
U.S. Cl. 173—12 8 Claims

8. In a fluid operated tool for tightening threaded fasteners and the like:

a housing;

a fluid operated motor including a rotary output shaft disposed in said housing;

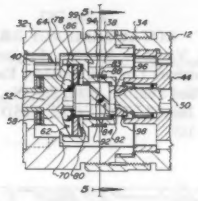
a fluid supply passage in said housing for conducting pressure fluid to said motor;

means forming a fluid exhaust passage in said housing for conducting exhaust fluid away from said motor to the exterior of said housing;

a valve closure member interposed in said exhaust passage and movable between an open position permitting exhaust fluid flow through said exhaust passage and a closed position blocking the flow of exhaust fluid through said exhaust passage to effect the stopping of said motor;

means responsive to starting of said motor to move said closure member to an open position to permit the flow of exhaust fluid through said exhaust passage, said means being responsive to decreasing motor speed to allow said closure member to move toward said closed position; and

a limited motion coupling drivably interconnecting said motor and said closure member;



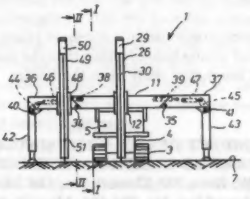
said coupling including a coupling member drivably connected to said output shaft and to said closure member and operable to permit said motor responsive means to move said closure member to said open position in response to increasing speed of said output shaft, and means forming a driving connection between said coupling member and said closure member which provides for limited axial and rotational movement of said closure member with respect to said coupling member to urge said closure member to move toward a closed position in response to decreasing speed of said output shaft.

4,346,766

DRILL CRADLE WITH ELONGATED SLIDE TRACK

Heinrich Manten, Salzgitter, Fed. Rep. of Germany, assignor to Salzgitter Maschinen und Anlagen Aktiengesellschaft, Salzgitter, Fed. Rep. of Germany

Filed Mar. 24, 1980, Ser. No. 133,121
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1979, 2913438
Int. Cl.³ E21B 7/02, 15/04
U.S. Cl. 173—23 9 Claims



1. A drill cradle comprising carriage means; an elongated slide track carried by said carriage means substantially parallel to the sole of a mine gallery in which the drill cradle may be used; at least one slide supported on said slide track movable therealong; an elongated rail mounted on said slide movable in axial direction and turnable about an axis; a boring bar and a drive therefor mounted on said rail; two side members respectively connected to opposite ends of said slide track for extending the latter in longitudinal direction, each of said side members having at least in a guide region for said at least one slide the same cross-section as such slide track and each of said side members being pivotally connected at one end to a respective one of said opposite ends of said slide track and having opposite said connected ends a free end; means connected to said

slide track and the respective side member for adjusting the position of each side member relative to said slide track; two supporting cylinder and piston units, each pivotally connected at one end to the free end of a respective side member, abutting when the respective side member forms an extension of said slide track, with the other end against the sole of the mine gallery; and means interconnected between each side member and the supporting cylinder and piston unit connected thereto for changing the position of the supporting cylinder and piston unit relative to the respective side member.

4,346,767

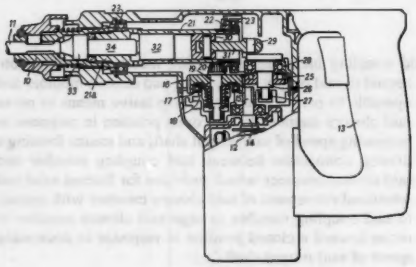
ROTARY IMPACT DRILL

Christopher A. Vaughan, Morden, England, assignor to Kango Electric Hammers Limited, London, England

Filed Jun. 11, 1980, Ser. No. 158,383

Int. Cl.³ E21C *1/12*; B25D *16/00*

U.S. Cl. 173—109 **1 Claim**



1. An electric hammer drill comprising a casing having a handle at its rearward end and carrying at its forward end a forwardly projecting drill bit holder, an electric motor mounted just forward of the handle and disposed with its axis of rotation at right angles to the axis of rotation of the holder, said casing housing means for rotating the holder, means for delivering impacts to the holder, an output gear on the motor shaft, a first pinion meshing with the output gear and connected to drive said means for the holder, a second pinion meshing with the first pinion and connected to drive said means for delivering said impacts to the holder, the respective axes of rotation of the first and second pinions being at diametrically opposite sides of the axis of the motor shaft, the four said axes being contained in a common plane, and the said axis of the second pinion being further than the said axes of the first pinion and the motor shaft from the holder.

4,346,768

IMPACT DEVICE WITH SINUSOIDAL ROTARY-TO-RECIPROCATIVE CONVERTER

Frederick W. Ross, 755 Klamath Dr., Del Mar, Calif. 92014

Continuation of Ser. No. 796,404, May 12, 1977, abandoned. This application Oct. 27, 1978, Ser. No. 955,488

Int. Cl.³ B25D *15/00*

U.S. Cl. 173—118 **33 Claims**

1. An impact device comprising:

a frame comprising an enclosing ease,

a crankshaft rotatably mounted in said enclosing case,

exciter means mounted in said enclosing case to rotate said cranshaft,

a body mounted for reciprocation along a selected straight path in said enclosing ease,

at least one connecting rod operatively connected to said crankshaft to reciprocate said body along said selected straight path upon rotation of said crankshaft,

ram means mounted for reciprocation on said enclosing case,

resilient means interposed between said body and said ram means for converting reciprocating motion of said body to impacting motion of said ram means,

impact tool means operatively mounted on said frame for impact by said ram means during each reciprocation thereof,

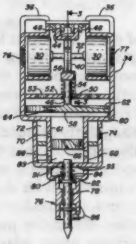
wherein the improvement comprises:

said exciter means comprising an electric drive motor,

a separate electric cooling motor with air pressure fan secured to the shaft thereof for forcing cooling air past said electric drive motor for cooling thereof,

motor control means including a master control for energizing both said cooling motor and an on-off control for the electric drive motor whereby said drive motor can only be operated with said cooling motor energized,

a dust-resistant inlet filter through which cooling air is admitted into and a dust-resistant outlet filter through which said cooling air is exhausted during operation of said cooling motor,



flow channeling elements including frame cross elements within said enclosing case to direct the flow of such cooling air from said inlet filter through said air pressure fan, past said drive motor for cooling thereof, and out through said outlet filter, and

said dust-resistant outlet filter is selected to have a pressure loss when such cooling air is flowing therethrough in relation to the pressure losses through the other elements past which such cooling air flows, to provide air pressure within said enclosing case above the ambient air pressure outside the enclosing case during operation of the cooling motor separately and during operation of both motors simultaneously for preventing dust from outside entering the enclosing case,

said separate cooling motor, said flow channeling elements, and said motor control means for reducing weight of structure and increasing efficiency of energy usage.

4,346,769

PERCUSSIVE TOOL DRIVE LINKAGE

Frank F. Simpson, Staines, England, assignor to Black & Decker Inc., Newark, Del.

Filed Dec. 12, 1979, Ser. No. 102,687

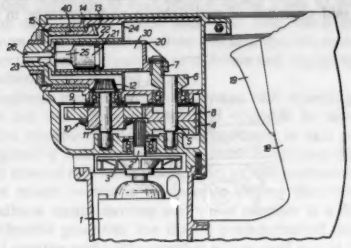
Claims priority, application United Kingdom, Dec. 12, 1978, 48306/78

Int. Cl.³ B25D *11/12*

U.S. Cl. 173—118 **15 Claims**

1. A percussive tool including a first member mounted for rotation about a first axis and connected to drive means operative to rotate the first member about the first axis, a second member rotatably connected to the first member at a position spaced from the first axis and arranged to reciprocate a third member, the arrangement being such that during percussive operation of the tool the first member drives the second member which in turn reciprocates the third member and thereby causes blows to be transmitted to a tool piece, wherein the improvement comprises means mounting the second member for pivoting movement about a second stationary axis and for sliding reciprocatory movement towards and away from the second axis, the means including a guide member receiving the

second member therein, the guide member being fixed against reciprocation but being free to pivot within the tool, and air



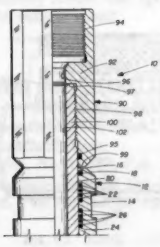
spring means between the second and third members for reciprocating movement of the third member relative to the second member.

4,345,770

HYDRAULIC JARRING TOOL

Harold K. Beck, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Oct. 14, 1980, Ser. No. 196,405
Int. Cl.[3] E21B *4/14, 31/107*
U.S. Cl. 175—297 19 Claims



1. A hydraylic well jar, comprising:
a case;
a mandrel longitudinally slidably disposed within said case;
chamber means containing a hydraulic fluid, said chamber means being defined by said case and said mandrel;
fluid bypass means comprising longitudinally oriented splines in the interior of said case;
fluid metering means on said mandrel; and
slidable seal means about said fluid metering means, said seal means having an elastomeric seal backed by a metal ring.

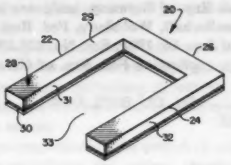
4,346,771

LOW-PROFILE, NON-PLATFORM WEIGH SCALE

Per-ölof G. Persson, Taberg, and Göte A. Göterdal, Tenhult, both of Sweden, assignors to Flintab Vagsystem AB, Jönköping, Sweden

Filed Jul. 8, 1981, Ser. No. 281,303
Int. Cl.[3] G01G *19/00, 21/22*
U.S. Cl. 177—145 24 Claims

1. A low-profile, non-platform type of weigh scale which rests on an underlying support surface and only receives an item support means with a load to be weighed thereon, said scale comprising:
a frame having at least two horizontally extending legs partially enclosing an area of the underlying support surface for defining an opening therebetween for receiving an item mover moving the load to be weighed, said legs having an upper member for directly receiving the item support means with the load to be weighed thereon, and a lower member for resting on the underlying support surface;



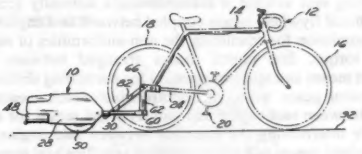
load cells positioned between said leg upper and lower members; and
signal output means for said load cells.

4,346,772

POWER ASSISTING DEVICE FOR A MANUALLY OPERATING VEHICLE

Dale L. Clifft, 5412 Crebs Ave., Tarzana, Calif. 91356

Continuation-in-part of Ser. No. 866,562, Jan. 3, 1978, abandoned. This application Nov. 22, 1978, Ser. No. 962,964
Int. Cl.[3] B62M *7/14*
U.S. Cl. 180—11 10 Claims



1. In combination with a vehicle having a plurality of wheels, a frame connecting said wheels, said wheels comprising a leading wheel and a trailing wheel, a power assisting assembly for said vehicle comprising:
a motor;
a driving wheel rotatably driven by said motor, said driving wheel being longitudinally spaced rearwardly of said trailing wheel, said driving wheel connected to a linkage assembly, said linkage assembly being connected to said frame, said linkage assembly including first means for limited lateral adjustment of said driving wheel in respect to said frame during turning movements of said vehicle, and second means connected to said linkage assembly for retarding said lateral adjustment;
said leading wheel and said trailing wheel being rotatably operable within the same plane with said vehicle moving in a straight direction, said driving wheel being rotatably driven within said same plane;
said linkage assembly includes a first pair of elongated members extending from said driving wheel, a second pair of members interconnecting the free end of said first pair of members and said frame of said vehicle; and
said first means being located at the connection between said first pair of members and said second pair of members, said first means including a pin capable of limited longitudinal adjustment within an elongated slot with there being a separate said pin and slot for each pair of interconnected said first member and said second member, whereby said separate pin and slot arrangement causes said driving wheel to be centered behind said trailing wheel if the said power assisting device encounters a slippery or loose surface.

4,346,773

APPARATUS FOR OPERATING A MOTOR VEHICLE

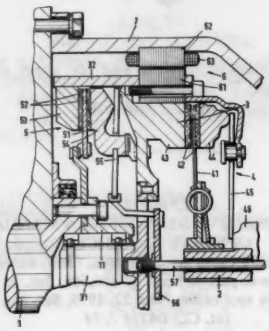
Peter Hofbauer; Karsten Ehlers, and Paulus Heidemeyer, all of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jun. 16, 1980, Ser. No. 159,836

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1979, 2925675

Int. Cl.³ B60K *9/04*

U.S. Cl. 180—165 3 Claims



1. In a motor vehicle having an internal combustion engine for driving said vehicle, a transmission, a normally present, conventional flywheel means coupled between said engine and said transmission for equalizing the non-uniformities of engine output torque, first clutch means arranged between said flywheel means and said transmission for permitting shifting of transmission gears, a second, controllable clutch means arranged between said engine and said flywheel means for automatically interrupting the coupling between said engine and said flywheel means and for re-coupling said flywheel means to said engine as a function of engine operating conditions, wherein said first and second clutch means comprise a clutch housing; the improvement comprising: starter-generator means having rotor means rigidly connected with said flywheel means for rotation therewith and stator means rigidly connected with said clutch housing, wherein said rotor means comprises a toothed, windingless rotor arranged on the periphery of said flywheel means in the form of a rim, and wherein said stator means comprises a direct current exciter current winding, a generator winding and a motor winding.

4,346,774

DOPPLER RADAR MOUNTING STRUCTURE FOR MOTOR VEHICLES

Yukitsugu Hirota, Yokohama; Akira Endo, Katsuta; Katsuhiro Kimura, Katsuta; Hiroshi Morozumi, Katsuta, and Kenji Sekine, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Nissan Motor Co., Ltd., both of Tokyo, Japan

Filed Sep. 25, 1979, Ser. No. 78,825

Claims priority, application Japan, Sep. 26, 1978, 53-118969; Dec. 13, 1978, 53-153070

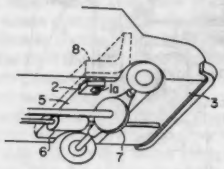
Int. Cl.³ B60T *8/10*

U.S. Cl. 180—167 11 Claims

1. In a motor vehicle having a substantially-flat undercarriage, a rear wheel axle having a differential housing and Doppler radar speed sensor including an antenna section and a sensor section mounted on the underside of the undercarriage of the vehicle for detecting the speed thereof, a mounting structure for said Doppler radar speed sensor comprising,

a chamber formed in said substantially-flat undercarriage of the vehicle, said chamber being recessed upward from the bottom level of said undercarriage and open downward for housing the whole of said Doppler radar speed sensor means, said recessed chamber being located in the vicinity of said differential housing and slightly in front of said rear wheel axle, and

means for mounting said Doppler radar speed sensor means in said chamber of said vehicle undercarriage in such a



manner that the opening end surface of said antenna section is directed rearwardly of the vehicle with a downward inclination toward the road surface and is positioned higher than the bottom level of said flat undercarriage of the vehicle.

4,346,775

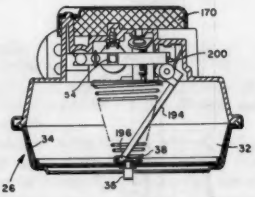
VEHICLE SPEED CONTROL

William A. Treadwell, Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 20, 1979, Ser. No. 50,237

Int. Cl.³ B60K *31/00*

U.S. Cl. 180—175 9 Claims



1. A vehicle speed governor for moving an engine throttle member movable in opposite directions between closed and open positions to control engine speed, said speed governor comprising:

(a) actuator means having a pressure responsive output member reciprocally movable for moving said throttle member in a throttle opening and a throttle closing direction;

(b) means defining a vacuum chamber on one side of said pressure responsive output member;

(c) valve means for providing a vacuum in said vacuum chamber for moving said pressure responsive output member in said throttle opening direction, said valve means including a valve member associated with a vacuum conduit and an atmospheric air conduit, said valve member movable from a first position relative to said vacuum port to progressively increase communication between said vacuum chamber and said vacuum port and to progressively decrease communication between said vacuum chamber and said atmospheric air port;

(d) a member movable in one direction upon an increase in engine speed and in a second direction opposite to the first direction upon a decrease in engine speed;

(e) first electrical coil means for selectively locking said member to said valve member when said engine is at a desired speed above a predetermined minimum speed;

(f) a normally open minimum speed switch connected in circuit with said electrical coil means to control the energization thereof;

(g) speed sensing means movable in response to the speed of

said vehicle for closing said minimum speed switch at vehicle speeds above a predetermined minimum speed, said speed sensing means moving said member in said second direction as said vehicle speed tends to decrease from said desired speed such that said valve member moves from said first position and said throttle moves in a throttle opening direction to maintain said engine speed at a substantially desired speed;

(h) feedback means operating between said actuating member and said valve member and operable to move said valve member toward said vacuum port as said pressure responsive means moves in its throttle opening direction and toward said atmospheric port as said pressure responsive means moves in its throttle closing direction, said feedback means moving said valve member at a first rate at throttle positions less than a predetermined minimum and moving said valve member at a second rate at throttle positions beyond said predetermined minimum position; and

(i) vacuum relief valve means connected between said vacuum chamber and the atmosphere, said relief valve means including means independent of said valve member movement for normally maintaining said relief valve means open to connect said vacuum chamber to the atmosphere through a passageway substantially dimensionally larger than said atmospheric air port so as to render said speed governor inoperable to control said vehicle speed, said vacuum relief means including second electrical coil means, which, upon energization, closes said relief valve means to isolate said vacuum chamber from the atmosphere and thereby render said speed governor operable to control said vehicle speed.

4,346,776

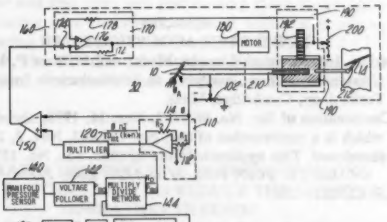
MEANS FOR IMPROVING AUTOMOBILE DRIVEABILITY

Lael B. Taplin, Bloomfield Hills, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 14,660, Feb. 23, 1979, abandoned, which is a continuation-in-part of Ser. No. 863,634, Dec. 22, 1977, abandoned. This application Apr. 16, 1981, Ser. No. 254,827

Int. Cl.³ B60K *13/02*

U.S. Cl. 180—179 **8 Claims**



1. In a vehicle powered by an internal combustion engine having a moveable throttle for determining the vehicle speed and a control linkage for setting the position of said throttle in response to operator commands, means for improving the driveability of the automobile, comprising:

means providing a first signal indicative of the position of the throttle set by the control linkage;

first multiplying means for multiplying said first signal by a factor which is determined by parameters of the vehicle and providing an output proportional to the product thereof;

second multiplying means for multiplying the output of said first multiplying means by a factor which is constituted by the quotient of a variable indicative of vehicle speed divided by the manifold absolute pressure of the vehicle engine and providing an output proportional to the product thereof;

means providing the difference between said first signal and the output of said second multiplying means;

differentiating means providing an output proportional to the derivative with respect to time of said output of said difference means;

control means responsive to the output of said differentiating means for modifying the output of said differentiating means in accordance with the desired dynamics of the engine and vehicle; and

means for adding to the position of said throttle set by said control linkage a displacement proportional to the output of said control means.

4,346,777

MOTOR UNIT FOR BICYCLES

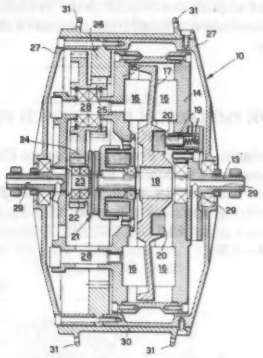
Amedeo A. Restelli, Cernusco Lombardone, Italy, assignor to Societa Italiana Catene Calibrate Regina S.p.A., Italy

Filed Mar. 12, 1979, Ser. No. 129,762

Claims priority, application Italy, Mar. 12, 1979, 21055/79[U]

Int. Cl.³ B62M *7/12*

U.S. Cl. 180—220 **1 Claim**



1. A motorized wheel for a bicycle comprising in combination:

a. a hollow substantially symmetrical and substantially cylindrical hub body rotatably supported on a central axle adapted to be fixedly mounted on a fork of a bicycle;

b. a stator including discoid portion fixed to said central axle within said hub body;

c. a discoid rotor rotatably supported between said discoid portions within said hub body;

d. a kinematic transmission including a plurality of gears rotatably mounted within said hub body and a driven member fixed to said hub body and in driving engagement with one of said gears;

e. said transmission including an electromagnetic clutch which connects said discoid rotor through said plurality of gears and said driven member to said hub body to move said hub body in rotation;

f. spokes connected between said hub body and a wheel rim to rotate said wheel rim with rotation of said hub body.

4,346,778

AUTOMATIC SAFETY BELT SYSTEM

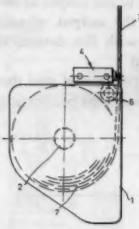
Erwin Blüggel, Kiel, and Wolfgang Mainka, Wolfsburg, both of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Mar. 7, 1980, Ser. No. 128,279

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1979, 2914643

Int. Cl.³ B60R *21/10*

U.S. Cl. 180—268 6 Claims



1. An automatic safety belt system with a belt band which can be wound on and off a spring-loaded roller mounted within a housing, one end of the belt band being attached to the roller, and a signaling means for signaling when a predetermined length of belt sufficient to allow it to be applied to a user is unwound, characterized in that the signaling means comprises an electro-optical device arranged in the vicinity of the belt band path and cooperating with contrast markings arranged on the belt band at positions related to the predetermined length, which positions are displaced from the end of the belt attached to the roller.

4,346,779

VAPOR IMPLOSION IN A CLOSED FLEXIBLE ENCLOSURE

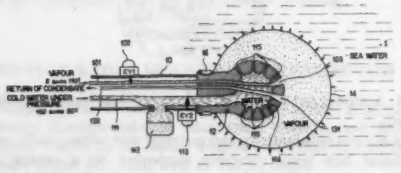
Michel G. Manin, Massy, France, assignor to Compagnie Generale de Geophysique, Massy, France

Filed May 16, 1980, Ser. No. 150,580

Claims priority, application France, May 17, 1979, 79 12589

Int. Cl.³ G01V *1/135, 1/38*

U.S. Cl. 181—120 12 Claims



1. A method for producing a shock wave in a liquid mass by an implosion of a volume of vapour in a closed, flexible enclosure positioned within said liquid mass, said method comprising the steps of introducing into said flexible enclosure vapour at an elevated temperature relative to ambient and at a pressure above hydrostatic pressure, said enclosure as a result being progressively inflated; ceasing the introduction of vapour and allowing said vapour to be supercooled without condensing, and thereafter condensing said vapour to cause a sudden drop in pressure to the saturation pressure of the vapour at ambient temperature of the liquid mass, said condensation resulting in an implosion which can be used for seismic prospecting purposes.

4,346,780

PURGING PIPES UNDER NOISE-ATTENUATING CONDITIONS

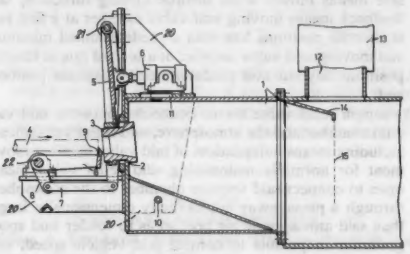
Heinz Packschies, Mülheim; Wilhelm Feldman, Duisburg, and Albert Hankel, Essen, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 10, 1981, Ser. No. 282,170

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1980, 3027387

Int. Cl.³ G10K *11/00;* F01N *5/00*

U.S. Cl. 181—198 2 Claims



1. In a structure serving as an assessory for purging pipes by means of steam blowing, and under noise-attenuating conditions, a receptacle into which steam will be blown upon discharge of such steam from one end of a pipe into whose other end steam has been injected, the receptacle having an opening, the improvement comprising:

a mouthpiece;

linkage means for pivotally suspending the mouthpiece at the opening;

lever means connected to the linkage means and carrying a stop member for selective positioning in front of and away from the opening; and

actuator means coupled to the linkage means for placing the mouthpiece over a front end of a pipe adjacent to said opening while removing said stop and, alternatively, pivoting the mouthpiece to clear said front end while causing the stop member to be placed in front of said front end.

4,346,781

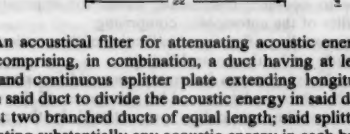
LINED-DUCT ACOUSTIC FILTER

Karl U. Ingard, South Lincoln, Mass., and William P. Patrick, Glastonbury, Conn., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 961,113, Nov. 16, 1978, abandoned, which is a continuation of Ser. No. 738,422, Nov. 3, 1976, abandoned. This application Jun. 9, 1980, Ser. No. 157,530

Int. Cl.³ F01N *1/06, 1/10, 1/24;* E04F *17/04*

U.S. Cl. 181—206 8 Claims



1. An acoustical filter for attenuating acoustic energy in a duct comprising, in combination, a duct having at least one rigid and continuous splitter plate extending longitudinally within said duct to divide the acoustic energy in said duct into at least two branched ducts of equal length; said splitter plate preventing substantially any acoustic energy in each branched duct from coupling to the other branched duct through said

plate by reflection of acoustic energy incident upon the plate back into the branched duct from whence the incident acoustic energy originated; the branched ducts having their input ends and their output ends acoustically coupled to each other, respectively; at least one of said branched ducts containing a means to alter the phase speed of the sound wave therein to define a flow path through said one branched duct having an acoustical length different from the acoustical length of the flow path through the other of said branched ducts to produce destructive wave interference at the output ends of said branched ducts and/or constructive wave interference at the input ends of said branched ducts thereby resulting in strong reflection of acoustic energy at the input ends of said branched ducts by which effects a reduced level of acoustic energy in said duct adjoing the outputs of said branched ducts is obtained.

4,346,782

METHOD OF PRODUCING AN IMPROVED VIBRATION DAMPING AND SOUND ABSORBING COATING ON A RIGID SUBSTRATE

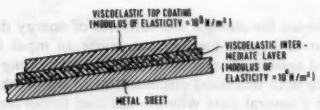
Robert Böhm, Schillerstr. 26, 6901 Wiesenbach, Fed. Rep. of Germany

Continuation of Ser. No. 100,162, Dec. 4, 1979, abandoned. This application Mar. 2, 1981, Ser. No. 239,848

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1978, 2852828

Int. Cl.³ E04B *1/82*; C04B *43/00*

U.S. Cl. 181—207 **16 Claims**


VISCOELASTIC TOP COATING
(MODULUS OF ELASTICITY = 10^8 N/m²)
VISCOELASTIC INTERMEDIATE LAYER
(MODULUS OF ELASTICITY = 10^8 N/m²)
METAL SHEET

1. A method of producing a vibration and sound damping and at the same time corrosion and abrasion resistant coating on a rigid substrate in which method two coating materials with different moduli of elasticity are successively applied to the substrate, characterized in that a first coating of a viscoelastic material is sprayed onto the substrate having after gelling and/or curing a modulus of elasticity of 5×10^6 to 5×10^8 dynes/cm^2 and that onto said first coating there is sprayed a second coating of a viscoelastic material which after gelling and/or curing has a modulus of elasticity of 5×10^7 to 5×10^9 dynes/cm^2, the modulus of elasticity of said second outer coating being at least 10 times greater than that of said first coating.

4,346,783

APPARATUS FOR TREATING FLOWING WORKING GASES PARTICULARLY TO REDUCE THE NOISE IN OPERATION THEREOF

Henry A. Scarton, Troy, N.Y.; Warren C. Kennedy, Pittsburgh, Pa.; Keith R. Gaylo, Syosset, N.Y., and Clark R. Caplan, Natick, Mass., assignors to Rensselaer Polytechnic Institute, Troy, N.Y.

Filed Sep. 26, 1980, Ser. No. 191,007

Int. Cl.³ F01N *1/08*

U.S. Cl. 181—230 **6 Claims**

1. An apparatus for treating flowing working gases flowing from a gas operating device having a discharge conduit with at least one discharge opening for the outflow of the working gases comprising:

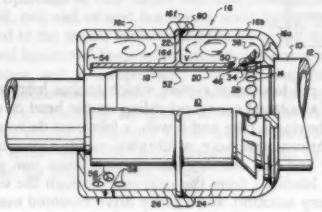
a housing connected around the discharge conduit and over the discharge opening defining a first and at least one other annular flow chamber around the conduit;

a dividing member in said housing for dividing said first and other annular flow chambers from each other, and defining a constricted flow passage between said first and other chambers;

an elastic valve member overlying the discharge opening and being flexible outwardly of the opening by the pressure of the working gases;

a ring member having a curved surface facing said valve member extending from the conduit toward said housing adjacent one end of said first chamber near the discharge opening, and spaced from said housing to define an inlet to said first chamber, said valve member being flexible outwardly against said curved surface by an outflow of working gases through the discharge opening;

said ring member forming an oblique face facing said first chamber and spaced from an edge of said dividing member to form an inlet to said constricted flow passage, whereby a toroidal annular vortex flow is formed by working gases in said first chamber and, with a sudden reduction of pressure of said working gases, said elastic valve member closes the discharge opening to prevent a flow of gases from said first chamber into the conduit.



4,346,784

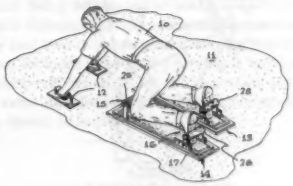
KNEE SUPPORT APPARATUS

William E. Hammond, 17330 Saticoy, Van Nuys, Calif. 91406

Filed May 27, 1980, Ser. No. 153,027

Int. Cl.³ A47C *7/50*

U.S. Cl. 182—230 **5 Claims**



1. Knee support apparatus comprising:

an elongated base member having an undersurface slidably engagable with a soft working surface;

cushion means carried on a top surface of said base member;

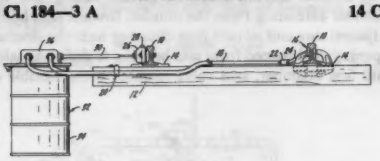
a front knee support means including a pair of spaced apart upright brackets secured to one end of said base member and a soft roller movably carried between the ends of said brackets; and

a rear foot support means including a pair of spaced apart upright brackets secured to the other end of said base member and a soft roller movably carried between the ends of said brackets.

4,346,785
RAIL LUBRICATOR

Earl E. Frank, Tallman, N.Y., assignor to Abex Corporation, New York, N.Y.

Filed Mar. 24, 1980, Ser. No. 133,337
Int. Cl.³ B61K *3/00*
U.S. Cl. 184—3 A 14 Claims

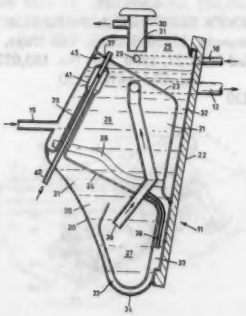


1. In a rail lubricator system which applies lubricant to the flange of a railroad car wheel riding on the head of a rail, the rail also having a base and a web, a lubricant delivery assembly, a lubricant reservoir, a lubricant conduit connecting the reservoir and the delivery assembly, at least one pump for pumping lubricant from the reservoir through the conduit to the delivery assembly and a pump drive mounted near the rail such that passing car wheels actuate the drive which then operates the pump, the improvement comprising a delivery assembly having a force-multiplying clamp means including lower-portions extending under the base of a rail, and upper portions for applying a multiplied clamping force for holding the delivery assembly to the rail, and tightening means so engaged with said lower portions as to cause the upper portions to apply said multiplied force when the tightening means are tightened on said lower portions.

4,346,786
LUBRICATION SYSTEM

Ronald A. Midgley, St. Albans, England, assignor to Rolls-Royce Limited, London, England

Filed Aug. 12, 1980, Ser. No. 177,514
Claims priority, application United Kingdom, Sep. 29, 1979, 7933868
Int. Cl.³ F01M *11/06*
U.S. Cl. 184—6.2 13 Claims

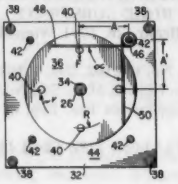


1. A tank suitable for holding a lubricant and adapted to comprise a portion of a lubrication system comprising first and second baffles respectively adapted to divide the interior of said tank into first, second and third series interconnected chambers, each adapted to contain said lubricant, an inlet adapted to supply a mixture of a gas and a lubricant to said first chamber, outlet duct means adapted to withdraw lubricant from said third chamber and venting means having an outlet through which said gas present in said first chamber is vented, said baffles being so adapted and arranged than when said tank is in its normal spacial disposition, lubricant supplied in operation to said first chamber flows into said third chamber via said second chamber, and if said tank is subsequently inverted with respect to said normal spacial disposition, any flow of lubricant from said third chamber to said second chamber is prevented or is of a sufficiently low level that an adequate quantity of lubricant is retained within said third chamber to provide a continuity of lubricant flow through said outlet duct means for a finite time period, and insufficient lubricant flows from said second chamber into said third chamber to obstruct said venting means, said outlet duct means being provided with means adapted to introduce a gas into lubricant passing therethrough when said tank is inverted with respect to said normal spacial disposition.

4,346,787
ENERGY RECOVERY DEVICE

Vernon Evans, Kinnelon, N.J., assignor to ERD, Inc., Fairfield, N.J.

Filed May 9, 1980, Ser. No. 148,554
Int. Cl.³ F03G *1/00*; F16F *1/06*
U.S. Cl. 185—37 17 Claims



1. A device for storage and retrieval of energy during displacement of a work-load system under an input force, the work-load system generating load forces increasing in correspondence with increased displacement of the work-load system from a neutral state wherein the load forces are approximately zero, comprising:

a. plate means;

b. first means for transferring the load forces generated by the work-load system to the plate means so as to provide displacement of the plate means in accordance with the load forces;

c. energy storage means capable of generating forces in opposition to the load forces; and

d. second means for transferring the forces generated by the energy storage means to the plate means generally continuously in opposition to the load forces transferred to the plate means so as to aid in the displacement of the work-load system from its neutral state, and for transferring the load forces generated by the work-load system to the energy storage means for storage generally continuously during displacement of the work-load system toward its neutral state.

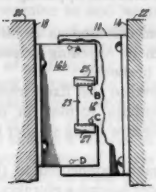
4,346,788
TAILORABLE DISCRETE OPTICAL SENSOR

Wu S. Shung, South Windsor, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Filed Nov. 13, 1979, Ser. No. 93,474
Int. Cl.³ B66B *1/40*
U.S. Cl. 187—29 R 1 Claim

1. A position encoder comprising first and second members relatively movable with respect to each other, said first member having disposed thereon a plurality of optical sources and sensors to form a plurality of discrete optical beams, said second member comprising a light-occluding vane of opaque material having a notch which is centrally disposed therein with respect to the direction of relative motion of the two members, the size of the vane and the size of the notch therein relative to the position of the optical sensors being such as to establish a pattern of ON/OFF states of the sensors which define a plurality of symmetrical positional zones including

zones on opposite sides of mutual central alignment of said two members, in either direction of relative motion of said two members, said notch serving to provide a capability for alter-



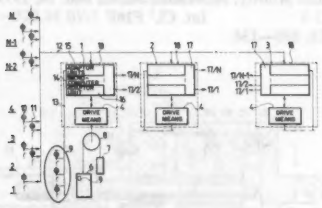
ing the effective opacity of a central portion of said vane by means of adding additional light-occluding material to said vane near the edges of said notch.

4,346,789

LIFT BATTERY CONTROL SYSTEM

Ralf C. Ekholm, Helsinki, Finland, assignor to Elevator GmbH, Zug, Switzerland

Filed May 8, 1980, Ser. No. 149,112
Claims priority, application Finland, May 16, 1979, 791570
Int. Cl.³ B66B *1/18*
U.S. Cl. 187—29 R **18 Claims**



1. An improvement in a control system for a battery of elevators in which a plurality of elevator cars serve a plurality of levels in a building; each of said levels being provided with means for making calls therefrom and means for determining the location of respective elevator cars; said elevator cars being provided with means for making calls therefrom; and location means for determining the location of the elevator cars, control means for said elevator cars, said control means having at least one microcomputer with at least one microprocessor; and said control means further having an elevator car drive means and control apparatus for controlling the elevator car drive means, wherein the improvement comprises: providing said control means with a number of data processing units, each of said data processing units having at least one microcomputer; said data processing units being adapted to jointly control the battery of elevator cars, with each respective unit having an equal position in relation to one another, being dependent upon the other units and provided with data concerning external calls of the elevator battery.

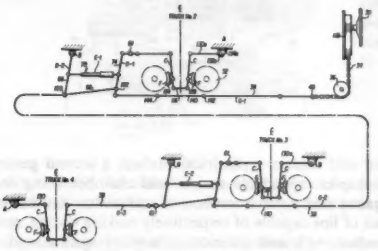
4,346,790

ARTICULATED CAR BRAKE SYSTEM

Robert B. Morrison; James T. Wade, and Robert E. Zimmerman, all of Topeka, Kans., assignors to Itel Corporation, San Francisco, Calif.

Continuation of Ser. No. 969,652, Dec. 15, 1978, abandoned.
This application Jan. 16, 1981, Ser. No. 225,723
Int. Cl.³ B61D *17/00*; B61F *3/12*; B61H *13/00*
U.S. Cl. 188—47 **15 Claims**

1. In an articulated railway car adapted to be coupled into a train, said railway car comprising a series of car units each having a center sill and connected end to end by articulated connectors to form a railway car, a single railway car truck having wheels bridging the gap between each pair of said end to end car units with the said ends mounted thereon, a hand-brake arrangement for braking said series of car units comprising (1) brake shoes disposed to be moved against wheels of a plurality of said trucks by a single hand operated mechanism, and to exert braking pressures on the wheels, (2) means for hand initiating a braking force to be transmitted to the brake shoes and (3) means for transmitting the said initiated force to the brake shoes comprising a series of brake rods, levers and linkages including a transverse horizontal lever which extends through openings in said center sills and on each side of the center sill, one end of said horizontal lever being operatively connected to the means for initiating the force and an opposite end of said horizontal lever being operatively connected to the brake shoes, and a compression force isolating link which permits transmission of tension forces only in the connection between the transverse horizontal lever and the brake shoes and which avoids movement of the force transmitting brake rods and levers when the brake shoes are moved by structure other than the hand initiating means.



10. In combination, a series of car units connected end-to-end by articulated connectors to form a railway car, a plurality of railway car trucks with wheels positioned one between each pair of car units and supporting adjacent car unit ends, brake means associated with the wheels of a plurality of said trucks including a pair of brake beams at each truck, and hand operable means for simultaneously actuating said brake means associated with at least two of said car trucks including a motion-transmitting linkage extending along the length of the car units a sufficient distance to span said two or more trucks and being movable lengthwise of the car, the brake means of each truck having a motion-transmitting system with interconnected members movable to actuate the brake beams, and a member of each system being connected to said linkage whereby movement of said linkage causes simultaneous actuation of the brake means for said two or more trucks, and each motion-transmitting system includes a member operable in tension to transmit motion when said linkage is moved to actuate the brake means but inoperable to transmit motion in a reverse direction from the brake means to said linkage.

4,346,791

FRICTION BRAKE

James C. Cumming, Pleasant Ridge, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Oct. 2, 1980, Ser. No. 193,511
Int. Cl.³ F16D *55/40*
U.S. Cl. 188—71.5 **5 Claims**

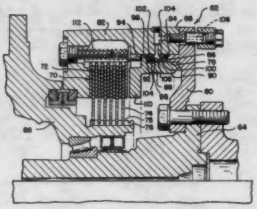
1. An improved brake for relatively rotating first and second members of the type which includes a housing secured to said first member, a plurality of brake discs carried by said housing for relative rotation therewith and axial movement therein, a plurality of reaction plates carried by said second member for relative rotation therewith and axial movement thereon, and said discs and said plates being intervened in alternating fashion to define a pack, said improvement comprising:

said housing having a central bore defined by a radially, inwardly extending annular wall and an interior cylindrical surface;

a piston having a tubular portion with an exterior cylindrical surface and a radially, outwardly extending wall having an annular surface extending outwardly from said cylindrical outer surface;

said piston being axially, slidably mounted in said bore with said annular wall, said interior cylindrical surface, said exterior cylindrical surface and said annular surface defining an expandable chamber between said bore and said piston;

a first generally U-shaped expandable seal in said chamber being seated against said annular wall of said bore and having a pair of lips capable of respectively making sliding, sealing contact with said interior cylindrical surface



and said exterior cylindrical surface; a second generally U-shaped expandable seal in said chamber being seated against said annular surface of said piston and having a pair of lips capable of respectively making sliding, sealing contact with said interior cylindrical surface and said exterior cylindrical surface;

means for selectively introducing hydraulic fluid to and discharging said hydraulic fluid from an intermediate region of said chamber between said first and said second seals, said hydraulic fluid being sealingly retained therein by said first and said second seals and capable of acting on said piston for selective movement of said piston axially relative to said bore; and

means for providing a compressive braking force to said pack being responsive to said selective movement of said piston.

4,346,792

DISC BRAKE DEVICE

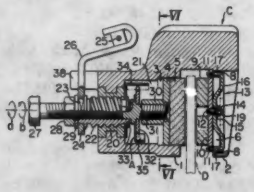
Mamoru Watanabe, Tokyo, Japan, assignor to Watanabe Engineering Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1980, Ser. No. 170,816

Claims priority, application Japan, Jul. 19, 1979, 54-100095[U]

Int. Cl.³ F16D 65/02

U.S. Cl. 188—73.32 **5 Claims**



1. A disc brake device comprising:

a brake disc;

a brake caliper having a first and a second clamp arms in straddling relation to said brake disc, said second clamp arm having a window and a plurality of notches formed in opposed inner edges of said window;

a movable friction pad connected to a pad pushing device in said first clamp arm and opposing one side surface of said brake disc;

a fixed friction pad disposed on an internal side of said second clamp arm in opposing relation to the other side surface of said brake disc;

a back plate secured to said fixed friction pad and having a plurality of notches formed in opposed outer edges thereof, said window being smaller in area than said back plate;

a stopper detachably connected to the rear of said back plate, said stopper having a plurality of first projections in engagement with the notches in said second clamp arm and in said back plate for holding said back plate against rotation relative to said second clamp arm and a plurality of second projections in abutting engagement with the external side surface of said second clamp arm for resiliently holding said back plate with said fixed pad against said second clamp arm.

4,346,793

MOTION SNUBBING DEVICE

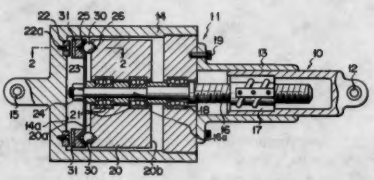
Takeshi Fuse, Kamakura, and Masaru Sekine, Hadano, both of Japan, assignors to NHK Spring Co., Ltd., Yokohama and NHK Precision Co., Ltd., Kanagawa, both of, Japan

Filed Feb. 7, 1980, Ser. No. 119,552

Claims priority, application Japan, Feb. 14, 1979, 54-15635

Int. Cl.³ F16F 7/10

U.S. Cl. 188—134 **5 Claims**



1. A motion snubbing device of the self-release type comprising:

a pair of telescoped support members capable of axial reciprocation relative to each other while being restrained from relative rotation;

movement converting means for converting the axial movement of one of said paired support members into a rotational movement;

a shaft supported by the other support member and coupled to said movement converting means so as to be rotated by said movement converting means;

said other support member including a housing having a frictional surface extending in the radial direction of said shaft;

a rotary inertia member coupled to said shaft and being rotatable relative to said shaft in a co-axial relation to said shaft while being restrained from movement in the axial direction of said shaft, said inertia member having an end face;

first recess means formed in said end face of said inertia member at positions near the periphery of said end face and at a constant radial distance from said axis;

an elastic plate member capable of flexing and being connected to said shaft for rotation in unison with said shaft, said elastic plate member being normally spaced apart from said end face of said inertia member;

second recess means formed on said elastic plate member on the side thereof facing said first recess means in said inertia

member and at positions corresponding to said first recess means;

rolling means interposed between and received in said first and second recess means for transmitting the rotation of said elastic plate member to said inertia member; and

brake shoes provided on said elastic plate member on the side thereof opposite said inertia member and facing said frictional surface of said housing,

whereby as said shaft is rotated in a given direction at an increasing acceleration responsive to relative telescoping axial movement of said support members, said rolling means are moved in such a manner as to come out of the associated first and/or second recess means against the biasing force of said elastic plate member, thereby bringing said brake shoes into frictional engagement with said frictional surface of said housing to stop the rotation of said shaft; and

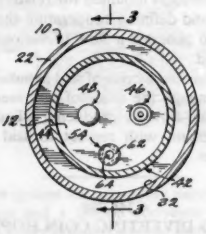
whereby if an external force is substantially continuously applied to said telescoped support members in one given direction, the engagement of said brake shoes with said frictional surface of said housing self-releases due to said inertia member's continued rotation.

4,346,794

SHOCK ABSORBER WITH IMPROVED BACK CHECK AND ANTI-DUMP VALVE MECHANISMS

Paul Smeltzer, Napierville, Ill., assignor to Maremont Corporation, Carol Stream, Ill.

Filed Feb. 4, 1980, Ser. No. 118,311
Int. Cl.³ F16F 9/20
U.S. Cl. 188—322.14 **6 Claims**



1. In a hydraulic shock absorber adapted to be connected between the sprung and unsprung masses of a vehicle including a tubular member defining a cylindrical chamber, a piston slidably mounted within said cylindrical chamber, a piston rod extending from one side of said piston outwardly from one end of said tubular member, closure means on said one end of said tubular member closing the one end of said tubular member and slidably sealingly engaging said piston rod, end closure means on the opposite end of said tubular member, connecting means for connecting said shock absorber operatively between said masses, hydraulic fluid filling rebound and compression spaces within said cylindrical chamber on the piston rod side of said piston and on the opposite side thereof respectively, said piston having passage means therethrough, rebound valve means disposed in cooperating relation with said passage means to control flow of fluid from said rebound space to said compression space, a compression valve mechanism carried by said piston for controlling flow of fluid from said compression space to said rebound space across said piston, and means to accommodate the flow of hydraulic fluid resulting from piston rod displacement, the improvement which comprises

means defining a fluid flow path leading from said compression space; and

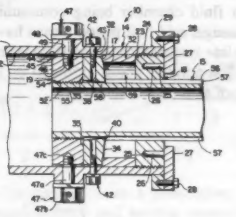
check valve means movably mounted within said flow path for movement from a first closed position generally closing said parallel flow path, into an open position permitting fluid flow through said flow path in response to an initial increase in pressure in said compression space, and from said open position into a second closed position preventing further flow of fluid through said flow path in response to an increase in the pressure of the hydraulic fluid in said compression space to a predetermined pressure above the initial increased level, said check valve means including means to progressively restrict flow through said path during a portion of the movement of said check valve means into said second closed position.

4,346,795

ENERGY ABSORBING ASSEMBLY

Donald L. Herbert, Lexington, Ohio, assignor to Harvey Hubbell Incorporated, Orange, Conn.

Filed Jun. 23, 1980, Ser. No. 162,053
Int. Cl.³ F16F 7/12
U.S. Cl. 188—375 **3 Claims**



1. An assembly for absorbing energy between first and second tubes subject to relative movement, the combination comprising:

a first guide ring rigidly coupled to the inside of the first tube, having an inner diameter substantially equal to the outer diameter of the second tube and receiving the second tube therein;

a cutting ring coupled to the inside of the first tube by shearable fasteners spaced from said first guide ring, said cutting ring having an inner surface defining an annular cutting edge with a diameter less than the outer diameter of the second tube, the second tube having an area of reduced diameter receiving said cutting edge therein; and

a second guide ring rigidly coupled to the second tube and received in the first tube on the side of said cutting ring opposite from said first guide ring, said second guide ring having an outer diameter substantially equal to the inner diameter of the first tube,

shearable means, coupled to the first tube and said second guide ring, for coupling said second guide ring to the first tube,

whereby, upon subjection of the two tubes to relative movement, said cutting edge cuts into a layer of the second tube thereby absorbing at least a part of the energy tending to relatively move the two tubes.

4,346,796

DRIVE MECHANISM WITH CLUTCH AND BRAKE ASSEMBLIES

Kunimitsu Ueno, Hirakata, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Aug. 25, 1980, Ser. No. 180,894
Int. Cl.³ B60K 41/24; F16D 13/74
U.S. Cl. 192—18 A **3 Claims**

1. A drive mechanism having a clutch assembly and a brake assembly, comprising:

a housing;

an input shaft rotatably supported by said housing;

a first inner drum of said clutch assembly fixedly secured to said input shaft, said first inner drum having formed therein

a first fluid passage for clutch actuation and a second fluid passage for lubricant;

a second inner drum of said brake assembly fixedly secured to said housing, said second inner drum having formed therein a third fluid passage for brake actuation and a fourth fluid passage for lubricant;

an output shaft rotatably supported by said second inner drum;

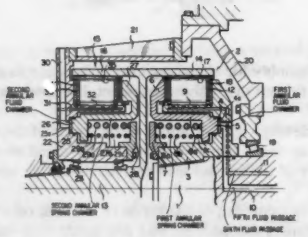
a first outer drum of said clutch assembly fixedly connected to said output shaft;

a second outer drum of said brake assembly fixedly connected to said output shaft;

a first annular retainer plate fixedly secured to said first inner drum;

first piston means operatively disposed relative to said first inner drum defining a first annular fluid chamber between one end face thereof and said first inner drum and a first annular spring chamber between said first annular retainer plate, said first inner drum and said first piston means, said first annular fluid chamber being communicated with said first fluid passage, said first piston means having a first annular pusher plate integrally formed therewith;

a plurality of first annular plates mounted on an outer peripheral surface of said first inner drum;



a plurality of first disks mounted on an inner peripheral surface of said first outer drum, said first annular plates and said first disks being alternately arranged;

first spring means disposed in said first spring chamber for biasing said first annular pusher plate toward engaging said first annular plates with said first disks;

a second annular retainer plate fixedly secured to said second inner drum;

second piston means operatively disposed relative to said second inner drum defining a second annular fluid chamber between one end face thereof and said second inner drum and a second annular spring chamber between said second annular retainer plate, said second inner drum and said second piston means, said second annular fluid chamber being communicated with said third fluid passage, said second piston means having a second annular pusher plate integrally formed therewith;

a plurality of second annular plates mounted on an outer peripheral surface of said second inner drum;

a plurality of second disks mounted on an inner peripheral surface of said second outer drum, said second annular plates and said second disks being alternately arranged; and

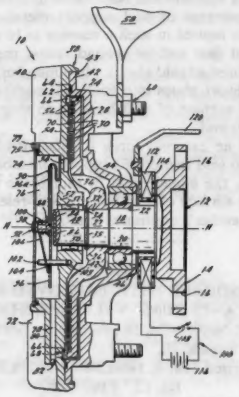
second spring means disposed in said second spring chamber for biasing said second annular pusher plate toward engaging said second annular plates with said second disks.

4,346,797

MAGNETICALLY ACTUATED VISCOUS FLUID COUPLING

Warren G. Bopp, Farmington Hills, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 25, 1980, Ser. No. 172,320
Int. Cl.³ F16D *35/00, 43/25*
U.S. Cl. 192—58 B **32 Claims**



1. A viscous fluid clutch comprising:

first and second members mounted for relative rotation about a common axis and defining cooperating shear surfaces;

means operative to generate a flow of viscous fluid between said surfaces; and

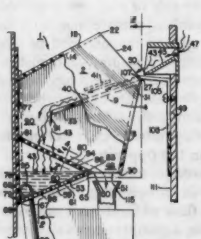
a valving element carried by one of said members and operable to frictionally engage the other of said members to effect modulation of said flow by producing a limited rotation of said valving element with respect to said valve element carrying member.

4,346,798

LIQUID DIVERTING COIN HOPPER

Davis M. Agey, III, 2054 Kingston Ave., Norfolk, Va. 23503

Filed Mar. 12, 1980, Ser. No. 129,775
Int. Cl.³ G07F *1/04*
U.S. Cl. 194—1 K **10 Claims**



10. A liquid diverting coin hopper for vending machines comprising:

a hopper having openings in the top and bottom thereof;

a front wall having an extension section;

said extension section forming a first downwardly extending support surface within said hopper;

a second downwardly extending support surface below said

first downwardly extending support surface, said second downwardly extending support surface slanting in the opposite direction from the first support surface;

said second downwardly extending support surface having a plurality of countersunk perforations on its surface and slots adjacent the edges of said second support surface, the peripheries of said perforations and said slots are substantially in contact with each other so as to present a substantially continuous barrier to the passage of liquid longitudinally of said second support surface, for the passage of liquid therethrough;

a compartment below said countersunk-perforations, said compartment for collecting liquid passing though said perforations; and

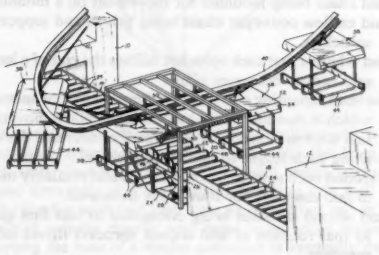
drainage means within said compartment for draining said liquid from within said compartment to the outside of said vending machine.

4,346,799

CONVEYOR SYSTEM WITH PART TRANSFER DEVICE

Dennis L. Dunville, Mishawaka, Ind.; William W. Seaton, Dexter, and Charles H. Good, Ann Arbor, both of Mich., assignors to Dearborn Fabricating & Engineering Corp., Mishawaka, Ind.

Filed Jun. 3, 1980, Ser. No. 156,058
Int. Cl.³ B65G 47/34
U.S. Cl. 198—367 6 Claims



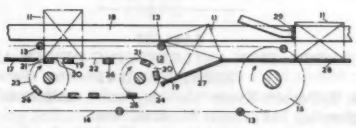
1. A conveyor system for conveying parts comprising a first conveyor section and a second conveyor section separated therefrom by an intermediate conveyor section, each conveyor section having a part supporting a surface, said conveyor sections being aligned to convey a plurality of parts over each conveyor section supporting surface, said intermediate conveyor section being shiftable between an upper operative position in which the supporting surfaces of the conveyor sections are generally co-planar to accommodate the passing of parts thereover and a lower position in which the supporting surface of said intermediate conveyor section is located below the supporting surfaces of said first and second conveyor sections, a plurality of carriers each supported for movement over said intermediate conveyor section, each carrier including a base which is located below the supporting surface of said intermediate conveyor section when the carrier is positioned above such conveyor section and the conveyor section is in its upper position to allow said parts to be conveyed over said conveyor sections and through the carrier, means for shifting said intermediate conveyor section between its upper and lower positions, the supporting surface of said intermediate conveyor section being located below the base of each carrier when the carrier is positioned above such conveyor section and such conveyor section is in its lower position to cause the part over the intermediate conveyor section to be supported by the carrier, and means for moving said carriers over said intermediate conveyor section to remove parts from or to place parts upon such conveyor section when said parts are supported by the carriers, said carriers and means for moving the carriers over said intermediate conveyor section being components of an overhead conveyor, said intermediate conveyor section supporting surface including a plurality of spaced apart rollers extending transversely to the direction of part movement over such conveyor section, each carrier base including a plurality of spaced apart rod members, said rod members located between rollers of said intermediate conveyor section when the conveyor section is in its upper position and a carrier is positioned thereabove with the periphery of the rollers extending above the rod members.

4,346,800

APPARATUS FOR TURNING OVER CONVEYED ARTICLES

John D. Bennett; Brian Holmes, both of Leeds, and David C. Morton, Harrogate, all of England, assignors to Baker Perkins Holdings Ltd., Peterborough, England

Filed May 12, 1980, Ser. No. 148,931
Claims priority, application United Kingdom, May 30, 1979, 7918743
Int. Cl.³ B65G 47/24
U.S. Cl. 198—412 6 Claims



1. Apparatus for turning over a procession of articles of generally rectangular shape and having opposite longer and shorter sides, comprising a dead plate devoid of discontinuities, a continuously travelling feed conveyer including pushers which engage successive articles in the procession to advance them in an upright condition supported by their shorter undersurfaces along the dead plate, movable platform means, movable at a position aligned with the end of the dead plate to support said shorter undersurfaces of the articles as they leave the dead plate and continue to be advanced by the pushers, means for imparting to the platform means movement relative to the pushers which is effective to cause the articles to topple forwardly in succession under gravity alone from the platform means as the articles continue to be advanced by the pushers, and a support positioned to receive in a lying condition and supported by their longer undersurfaces the articles toppling forwardly from the supporting means at a level permitting further conveyance along it of said articles by said pushers.

4,346,801

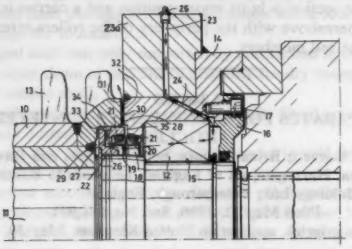
LUBRICATING SPROCKET DRUM MOUNTING

Manfred Redder, Bergkamen-Oberaden, and Dieter Grundken, Lunen, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Jun. 10, 1980, Ser. No. 158,044
Int. Cl.³ B65G 45/02
U.S. Cl. 198—500 15 Claims

1. A drive arrangement for transferring drive to a scraper assembly of a scraper-chain conveyor, the drive arrangement comprising a drivable sprocket drum rotatably mounted in a drive frame by two bearings, the bearings being individually located in housings at the ends of the sprocket drum, a respective seal being located between each bearing and the adjacent end of the sprocket drum, each seal having at least two relatively movable parts, means being provided for supplying lubricant to the bearings and the seals, wherein the lubricant supply means includes a respective lubricant path for the bearing and the seal at each end of the sprocket drum, each lubricant path passing through both its bearing and its seal, wherein each lubricant path includes a lubricant discharge passage leading away from the respective seal, and wherein each lubricant discharge passage includes a radial gap formed between an end face of the sprocket drum and an adjacent end face of the respective bearing housing, and axial channels in a respec-

tive support ring, radial channels in said support ring, and an axial gap formed between the outer periphery of said support



ring and an inner surface of a respective groove machined in the adjacent end face of the sprocket drum.

4,346,802

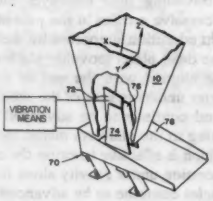
COMBINATION ANTI-BRIDGING DEVICE AND VIBRATING TRAY

Jakhin B. Popper, Kyriat Motzkin, Israel, assignor to Popper Engineering Ltd., Kyriat Motzkin, Israel

Division of Ser. No. 852,539, Nov. 17, 1977, abandoned. This application Sep. 24, 1979, Ser. No. 77,934

Int. Cl.³ B65G *47/44*

U.S. Cl. 198—533 **3 Claims**



1. Apparatus for preventing bridging of bulk material in a housing for storing or handling goods in bulk, the housing having an egress opening for discharge of the goods therefrom and having defined therein a flowpath direction axis along which the goods travel within the housing en route to the egress opening when in use, the apparatus comprising:

flow discharge control means for preventing bridging of the goods during travel thereof through the housing, said flow discharge control means comprising a first unitary generally flat plate disposed along said flowpath direction axis, at least a part of said plate being within the housing when in use;

vibration means for causing vibration of said plate relative to the housing along a vibration axis parallel to said plate and substantially perpendicular to said flowpath direction axis in longitudinal reciprocal motion, thereby applying a shearing force to the goods along an axis orthogonal to the flowpath direction axis without appreciably compacting the goods; and

a tray disposed in operative association with the egress opening of the housing downstream thereof and extending outwardly therefrom, said tray being arranged for vibration generally parallel to the plane thereof for urging said goods away from said egress opening in an outflow direction, wherein said unitary generally flat plate is fixedly connected to said tray and arranged such that the plane of said plate lies generally parallel to said outflow direction and wherein said vibration means are connected to said tray, thereby causing vibration of said tray and said plate along an axis parallel to said outflow direction and thus producing a combined anti-bridging action within the confines of said housing and a removal action of goods from the housing along said tray.

4,346,803

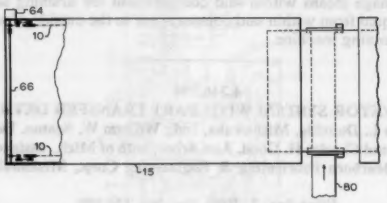
CONVEYOR

Wolfgang Haessler, Orangeville, and Djuro Slivar, Brampton, both of Canada, assignors to Haessler & DeWay Limited, Brampton, Canada

Filed Jan. 3, 1978, Ser. No. 866,637

Int. Cl.³ B65G *23/44*

U.S. Cl. 198—813 **4 Claims**



1. Improved construction for endless conveyors driven by an endless chain,

said chain being mounted for movement on a mounting,

said endless conveyor chain being driven and supported by sprockets,

and where a first such sprocket defines the end of a length of said endless conveyor chain,

the shaft mounting said sprocket forming part of an assembly which is movably on said mounting to allow movement of said shaft in a direction to increase or decrease the tension along such length in said endless chain,

a second such sprocket, chain driven and rotatably mounted in said assembly for translation therewith,

said second sprocket being connected to said first sprocket so that rotation of said second sprocket drives said first sprocket,

drive means mounted on said mounting including a third sprocket connected by a drive chain to said second sprocket for driving the latter,

said third sprocket being disposed on the opposite side of said second sprocket from said conveyor chain length whereby tension in said drive chain opposes tension in said length of conveyor chain,

wherein said second sprocket is of smaller diameter than said first sprocket.

4,346,804

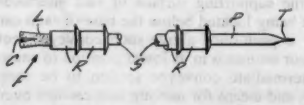
STORING AND HANDLING OF HOLLOW RIVETS

John Powderly, Birmingham, England, assignor to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 912,373, Jun. 5, 1978, abandoned. This application Oct. 2, 1980, Ser. No. 193,146

Int. Cl.³ B65D *85/62*

U.S. Cl. 206—338 **6 Claims**



1. A rivet assembly comprising: a tubular sleeve with an integrally formed engagement means disposed at one end thereof, said sleeve being adapted to substantially receive a blind-riveting mandrel introduced at the other end; and a row of hollow rivets on the exterior of the sleeve slidably disposed

thereon in a head-to-tail relation, the head of the first rivet in the row being nearest to the engagement means, said engagement means being integrally formed on the tubular sleeve so as to prevent said rivets from sliding thereover, said rivets further being arranged to slide over said other end onto said mandrel.

4,346,805

CONTAINER

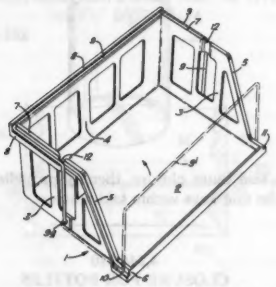
Paul H. Upperton, Shoreham-by-Sea, England, assignor to GPG International Limited, Warwickshire, England

Filed Sep. 18, 1980, Ser. No. 188,579

Claims priority, application United Kingdom, Oct. 30, 1979, 7937534

Int. Cl.³ B65D *21/04*

U.S. Cl. 206—506 **20 Claims**



1. A container for stacking as a vertical column with a similar container which comprises a substantially flat base; wall means upstanding from the base, said wall means comprising opposed forwardly and rearwardly extending side wall parts which together with said base form an open front and an open top which wholly overlie said base; upper edge means for supporting the base of a similar container in vertically stacked overlying relationship, said upper edge means being located on the wall means spaced from and rearwardly of the front of the base, and said side wall parts forwardly of the upper edge means being shaped to permit access to the container from the sides thereof adjacent to its open front, and a pivotally mounted frame member movable from a first, inoperative, position clear of said open front and open top into a second position in which it abuts stop means forwardly of and below said upper edge means, said frame member in its second position providing a support part which extends upwardly from said stop means and with respect to the base to provide support forwardly of the upper edge means to a said overlying container beneath the base of that container adjacent to the front thereof where the base of the overlying container is substantially parallel with the base of the underlying container and will project forwardly in cantilevered manner from the support provided by said upper edge means of the underlying container.

4,346,806

SHELF ORGANIZER

Rafael T. Bustos, Clarkston, Ga., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Mar. 11, 1980, Ser. No. 129,342

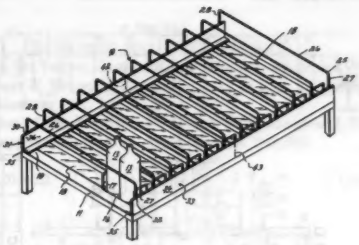
Int. Cl.³ A47F *7/00*

U.S. Cl. 211—49 S **10 Claims**

1. A shelf organizer comprising,

a plurality of horizontal wires having end sections extending downwardly from the opposite ends thereof,

two sheets of corrugated plastic material, each of said sheets comprising at least one generally flat ply of plastic material and one corrugated ply of plastic material, each of said sheets being scored longitudinally thereof such that the sheets may be folded about the longitudinal score line to locate one section of each of said sheets including both said generally flat ply and said corrugated ply in a horizontal plane and the other section including both said generally flat ply and said corrugated ply in a vertical plane, the vertical section having an exposed edge generally parallel to the score line,



vertically extending pockets aid vertical section of each of said sheets of corrugated plastic material, said pockets being defined between the corrugations of said corrugated plastic material and said pockets being open at said exposed edge, and

one end section of each of said wires extending downwardly into a pocket of one of said corrugated sheets of plastic material.

4,346,807

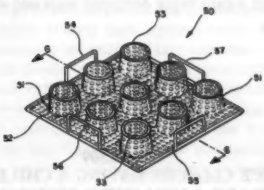
FLATWARE PROCESSING SYSTEM

Clyde R. Weihe, 17 Linbergh Ave., Needham Heights, Mass. 02194

Filed May 5, 1980, Ser. No. 146,206

Int. Cl.³ A47F *7/00*

U.S. Cl. 211—60 R **2 Claims**



1. Basket means for holding flatware while being washed and rinsed in a dishwashing machine comprising:

(a) a horizontally disposed base member; and

(b) a plurality of individual, spaced-apart receptacles supported on said base member, each receptacle having the shape of a right, truncated cone for containment of a limited number of pieces of flatware, each receptacle being opened at the top and defined by a horizontally disposed circular-shaped opening of pre-determined diameter in a plane parallel to the said base member, said circular-shaped top opening limiting the number of pieces of flatware that can be placed in each said receptacle and the truncated shape of said receptacle allowing the flatware placed in the receptacle to spread out at the bottom of the receptacle, exposing the flatware surfaces to washing and rinsing water,

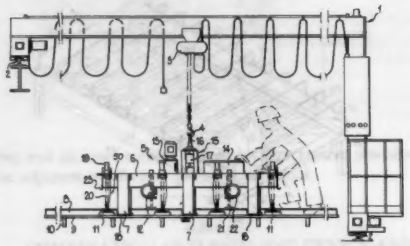
said base member and said receptacles being of porous construction thereby allowing the free passage of wash and rinse water into and from the inside of the flatware receptacles.

4,346,808

DEVICE FOR USE IN WELDING REINFORCEMENT MEMBERS TO PANEL PLATES

Walther Garlung, Kalandseid, and Helge Dahl, Os, both of Norway, assignors to Total Transportation Systems (International) A/S, Os, Norway

Filed Jul. 18, 1979, Ser. No. 58,460
Claims priority, application Norway, Mar. 30, 1979, 791077
Int. Cl.³ B66C 5/04
U.S. Cl. 212—212 **14 Claims**



1. Apparatus for transporting and positioning a sectional reinforcement member relative to a panel plate to which it is to be attached comprising:

boom means,

means angularly movable about a generally vertical axis for connecting said boom means to a crane,

a plurality of gripping means for holding a sectional reinforcement member,

first means for mounting said plurality of gripping means to said boom means,

a plurality of lifting magnets for holding a panel plate,

second means for mounting said plurality of lifting magnets to said boom means,

at least one jack means for pressing said sectional reinforcement member against said panel plate,

said boom means being equipped with said at least one jack means.

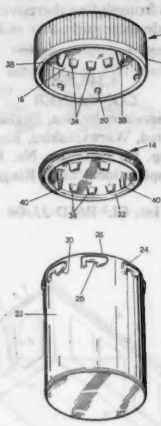
4,346,809

TWO-PIECE CLOSURE HAVING A CHILD-RESISTANT MODE AND A NON CHILD-RESISTANT MODE

Maximillian Kusz, Waterville, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 30, 1981, Ser. No. 259,134
Int. Cl.³ B65D 55/02
U.S. Cl. 215—214 **7 Claims**

1. A convertible child-resistant closure for an open mouth container having an annular rim on the open end thereof, and circumferentially spaced locking lugs having downwardly opening notches, comprising an outer closure, said outer closure including a circular panel section and an annular skirt depending from the periphery thereof, said skirt sized to fit around the annular rim of the container, a plurality of integrally formed, circumferentially spaced keys projecting inwardly from the inside annular surface of said skirt and constructed and arranged to fit within the notches of said locking lugs; a resilient, disc shaped liner within said outer closure; means on said outer closure to retain said liner within said outer closure, permitting limited axial movement of said liner within said closure, selectively engagable spacing means on said panel and said liner providing two relative axial positions of said liner within said outer closure, said spacing means arranged to deform said resilient liner between said rim and said spacing means when said liner is in one axial position



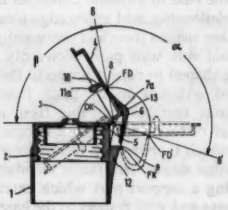
relative to said outer closure, thereby providing an upward bias to retain said keys within said notches.

4,346,810

CLOSURE FOR BOTTLES

Richard Kneissl, Munich, Fed. Rep. of Germany, assignor to Nova-Handels AG, Zurich, Switzerland

Filed Sep. 9, 1980, Ser. No. 185,535
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1979, 2936717
Int. Cl.³ B65D 43/16
U.S. Cl. 215—237 **8 Claims**



1. A bottle closure means adapted to be mounted on the upper end of a bottle neck, said closure comprising:

a cylindrical collar having a pour opening formed therein;

a cap hinged to said collar and having a sealing member thereon for engaging and sealing said pour opening, said cap being movable about a cap hinge axis from an open position wherein said sealing member is spaced from said pour opening to a closed position wherein said sealing member engages and seals said pour opening;

at least one spring acting strip having a first hinged connection to a collar projection at a first hinged point and a second hinged connection to said cap at a second hinged point,

said cap being movable to a reversal position between said open and closed positions wherein said spring acting strip commences imparting a force on said cap to move said cap to said closed position;

said collar, cap and spring strip being integrally formed from plastic and being mutually joined by plastic hinges at said

hinge axis, said first hinged point and said second hinged point;

a first angle being formed by a first line passing through said second hinged point and said hinge axis when said cap is in said open position and a second line passing through the same points when said cap is in its said reversal position;

a second angle being formed by said second line and a third line passing through the same points when said cap is in said closed position;

said second angle being smaller than said first angle.

4,346,811

PILFER-PROOF CLOSURE CAP OF PLASTIC MATERIAL

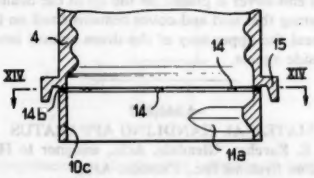
Fernand Hilaire, Monte Carlo, Monaco, assignor to Captocap Limited, Vaduz, Liechtenstein

Filed Mar. 8, 1979, Ser. No. 18,789

Claims priority, application France, Mar. 28, 1978, 78 08912

Int. Cl.³ B65D *41/34*

U.S. Cl. 215—252 **2 Claims**



1. A pilfer-proof closure cap of plastic material for sealing a container having a threaded neck portion, said closure cap comprising an internally threaded shell to be screwed on the neck of the container and a ring to be applied beneath an annular projection formed on the neck of the container, said ring being joined to the shell by means of bridges of plastic material designed to tear-off at the time of unscrewing of the cap, said ring having a free end which has a rib which is intended to be applied beneath said annular projection of the neck of the container, wherein the rib of the ring extends over less than one-half the circumference of the ring and at least one bridge having a larger cross-sectional area than the other bridges is disposed substantially opposite to said rib.

4,346,812

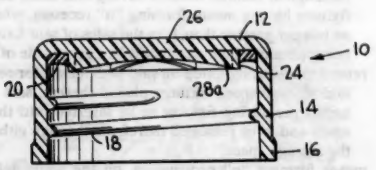
PLASTIC CLOSURE WITH REINFORCED CENTRAL PANEL

John N. Banich, Sr., Chicago, Ill., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Mar. 10, 1981, Ser. No. 242,197

Int. Cl.³ B65D *53/02*

U.S. Cl. 215—352 **3 Claims**



1. A closure cap for carbonated beverages and like products packaged at a pressure other than atmospheric, said closure cap being of a molded plastic material construction and comprising an end wall and a depending skirt, an annular sealing ring seated on an underside of said end wall adjacent said skirt and surrounding a central panel of said end wall, and reinforcing means integral with said end wall and in the general area of said central panel, said end wall having on said underside an annular seat for said sealing ring with said annular seat being in part defined by a depending annular rib, and said reinforcing means being on said underside of said end wall within said annular rib, said reinforcing means being in the form of radiating ribs intersecting at the center of said central panel and extending radially outwardly to said annular rib, said radiating ribs being of substantially the same height as said annular rib at their intersections with said annular rib.

4,346,813

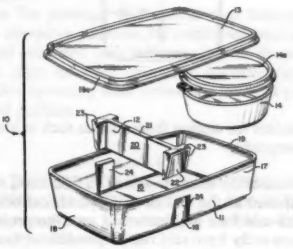
CLOSURED AND DIVIDED BOX

Kazunobu Cho, Tokyo, Japan; Roger P. Beauchamp, Harrisville, and Robert F. Batemou, Greenville, both of R.I., assignors to Dart Industries Inc., Los Angeles, Calif.

Continuation of Ser. No. 710,755, Aug. 2, 1976, abandoned. This application Oct. 25, 1977, Ser. No. 845,505

Int. Cl.³ B65D *25/04*

U.S. Cl. 220—22 **1 Claim**



1. A sealable storage container having an interconnecting side and bottom wall construction said side wall including inwardly directed oppositely positioned protrusions of a width of between about 25% and 60% of the height of said side wall and which extend between points proximate said bottom wall and the upper edge of said side wall, said protrusions gradually increasing in depth toward their upper extents to create a wedge-like appearance inwardly of said container and an upright imperforate divider member having an upright flange at either end thereof, each of said flanges being bounded along its vertical and upper extents by outwardly extending walls that mate with said protrusions and which at the lower extent thereof blend into said flange in a shape compatible with the interconnection between said side and bottom wall construction.

4,346,814

SIDE SEAM STRIPES

Kenneth R. Rentmeester, Varrington, Ill., assignor to American Can Company, Greenwich, Conn.

Filed Mar. 3, 1980, Ser. No. 126,190

Int. Cl.³ B65D *7/34*; B29D *23/10*; B65D *1/16*

U.S. Cl. 220—75 **7 Claims**

1. A container having a hollow body formed from a flat sheet of metal and containing a seam along a side thereof wherein said seam has exposed raw metal facing inwardly, said container including a side seam stripe comprising a coating being thixotropic in nature and applied over the raw metal at a rate of about 5 mg per square inch to gel and thus adhere across the rough surface of the exposed raw metal sufficiently to substantially prevent any metal exposure after application and during curing at elevated temperatures.

2. The container of claim 1 wherein said side seam is a welded lap joint presenting a raw edge of metal inwardly into said container and portions of inward metal surface adjacent

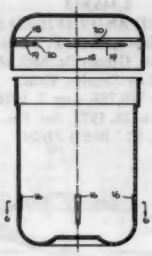
said joint which are rough and raw metal and said curing temperatures are in the range of 250° F. to 400° F.

4,346,815

FROZEN FOOD CONTAINER

Roger F. Raymor, and Les Adams, both of Toledo, Ohio, assignors to Seligco Food Corporation, Brooklyn, N.Y.

Filed Nov. 5, 1980, Ser. No. 204,211
Int. Cl.³ B65D *41/16, 41/18*
U.S. Cl. 220—306 7 Claims



1. A container for storing frozen foods such as ice cream and the like, comprising:

a base,

a cylindrical body member joined to said base,

a rim disposed at the end of said cylindrical body member opposite said base and including an edge projecting radially outwardly from said rim perpendicular to the longitudinal axis of said container,

a cover adapted for slidable positioning over said rim, and

means, disposed on the inner surface of said cover and adapted for interlocking engagement with said edge of said rim, for securing said cover on said cylindrical body member, said securing means comprising a first annular ridge disposed on the inner surface of said cover and projecting radially inwardly perpendicular to the longitudinal axis of said container, and a plurality of second annular ridges disposed on the inner surface of said cover and projecting radially inwardly perpendicular to the longitudinal axis of said container, said plurality of second annular ridges being spaced apart from said first annular ridge so as to form a plurality of spaces on the inner surface of said cover between said first and second ridges for receiving said edge of said rim when said cover is disposed on said cylindrical body member and thereby securing said cover on said body member.

4,346,816

PLASTIC END COVER FOR DRUMS

Gilles E. A. Caille, Paris, France, assignor to Expandet, Paris, France

PCT No. PCT/FR80/00044, § 371 Date Dec. 9, 1980, § 102(e) Date Dec. 9, 1980, PCT Pub. No. WO80/02273, PCT Pub. Date Oct. 30, 1980
PCT Filed Mar. 25, 1980, Ser. No. 220,066
Claims priority, application France, Apr. 24, 1979, 79 10314
Int. Cl.³ B65D *41/16, 41/18*
U.S. Cl. 220—306 1 Claim

1. An end cover for covering and protecting a drum having an upper tray with a circumferential lip, comprising:

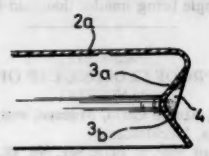
a circular top provided with an outer circumferential edge, said top having a diameter corresponding to the diameter of the drum to be covered and having an axis of symmetry perpendicular to the plane of said top; and

a peripheral member comprising:

a convergent linear wall integral with said outer edge of said top;

a divergent linear wall joined to said convergent linear wall and forming a circumferential V-shaped groove opening toward the exterior of said walls; and

flat ribs spaced from one another around said V-shaped groove, each of said ribs being disposed in a vertical radial plane passing through said axis of symmetry, protruding from and being integral with said walls on either side of the apex of said V-shaped groove formed



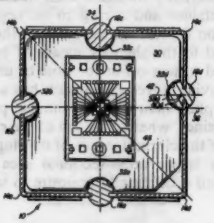
by said walls, and being positioned within said V-shaped groove to add rigidity to said walls and for preventing said walls from spreading apart, whereby said peripheral member is forcefully deformed when said end cover is placed on the lip of the drum thereby assuring that said end cover remains fixed on the drum to seal the upper tray of the drum against intrusion of outside agents.

4,346,817

MATERIAL HANDLING APPARATUS

DeWayne E. Karcher, Glendale, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 37,187, May 8, 1979, abandoned. This application May 27, 1980, Ser. No. 153,367
Int. Cl.³ B65G *1/08*
U.S. Cl. 221—312 R 9 Claims



1. Material handling apparatus comprising:

a magazine having substantially planar walls defining a prismatic interior storage space having a rectangular cross section, and open top and bottom faces, said magazine adapted to have stored therein a plurality of substantially rectangular laminar fixtures having four sides, each of said fixtures having means forming "n" recesses, where "n" is an integer greater than 1, in the sides of said fixture, there being no more than one recess in a given side of a fixture;

retention means mounted on said wall means for retaining in said storage space fixtures placed therein, said retention means permitting fixtures to be inserted into the storage space and to be removed therefrom through either face of the storage space;

means forming "n" protrusions, on the walls defining the storage space there being no more than one protrusion on a given wall, said protrusions being substantially parallel to each other and extending between said top and bottom faces, and each of said protrusions projecting into said space, said protrusions and recesses in the fixtures being asymmetrically and co-operatively positioned so that each protrusion projects into a corresponding recess of each fixture stored in the magazine, and so that each fixture

stored in the magazine can have only one orientation with respect to the magazine and so that each fixture stored in the magazine is prevented from substantially changing its orientation with respect to the magazine irrespective of the number of fixtures stored therein and irrespective of subsequent changes in orientation of the magazine.

4,346,818

ARRANGEMENT FOR THE THERMAL SPRAYING OF METAL AND CERAMIC POWDERS

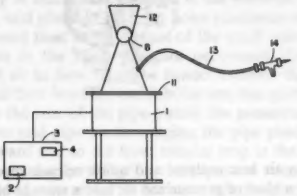
Erich Bösmiller, Lohhof, Fed. Rep. of Germany, assignor to Motoren-und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Jan. 23, 1980, Ser. No. 114,520

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1979, 2946569

Int. Cl.³ B67D *5/34*

U.S. Cl. 222—58 **3 Claims**



1. Arrangement for the thermal spraying of metal powders and ceramic powders and their admixing through a powder storage receptacle, and arrangements for the conveyance of the powder from the storage receptacle to a spray gun, comprising the powder storage receptacle with the conveying arrangements is installed on a precision scale which includes a device for the continuous registration of a weight change of powder material in the storage receptacle per time interval, and a calculating circuit in which the weight loss ΔG presently registered during one time interval is divided by the duration of the time interval ΔT; said precision scale further comprises a scale with an electronic display and an electronic data output and said calculating circuit comprising a microcomputer.

4,346,819

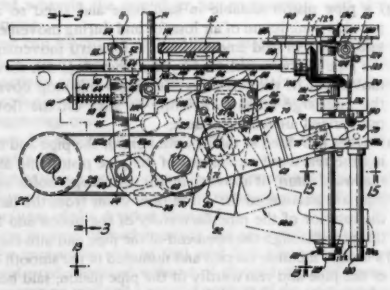
CARTON FILLER AND VOLUME ADJUSTER APPARATUS FOR PACKAGING MACHINES

Ivan L. Kauffman, Commerce Township, Oakland County, and Gregory J. Dwyer, Livonia, both of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Oct. 29, 1979, Ser. No. 89,056

Int. Cl.³ G01F *11/02*

U.S. Cl. 222—41 **14 Claims**



1. A filler drive and volume adjustment apparatus for use in a packaging machine which forms, fills and closes cartons, characterized in that said apparatus includes:

(a) at least one filler operating shaft for operating a carton filler apparatus on a packaging machine;

(b) a pivotally mounted roller carrier plate;

(c) at least one roller means mounted on said carrier plate and disposed for operative engagement with the lower end of said at least one filler operating shaft for actuating said filler operating shaft between a lowered position and a raised position;

(d) a first cam follower link operatively attached to said roller carrier plate for pivoting said carrier plate between operative positions;

(e) a cam carrier link having a roller cam operatively engaged with said first cam follower link;

(f) means for rollably supporting one end of said cam carrier link;

(g) a second cam follower link having one end pivotally mounted on the packaging machine and the other end pivotally connected to the other end of said cam carrier link; and,

(h) means for pivoting said second cam follower link between operative positions for oscillating said cam carrier link and said first cam follower link to pivot the roller carrier plate between operative positions for actuating said filler operating shaft between a lowered position and a raised position.

4,346,820

APPARATUS FOR MIXING AND DISPERSING TWO SUBSTANCES UNDER STERILE CONDITIONS

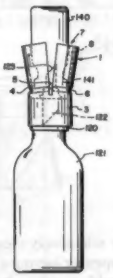
Claudio Cavazza, Rome, Italy, assignor to Sigma-Tau Industrie Farmaceutiche Riunite, Italy

Filed May 2, 1980, Ser. No. 145,977

Claims priority, application Italy, May 2, 1979, 48916 A/79

Int. Cl.³ A61J *1/00*

U.S. Cl. 222—83 **4 Claims**



1. Apparatus for mixing and dispensing two substances comprising in combination:

a first container for sealingly containing a first substance, said first container having a neck of reduced diameter defining a discharge opening and being sealed by a stopper, said container neck with its stopper having a large diameter portion;

a second container for sealingly containing a second substance, said second container having a neck defining a discharge opening;

a sleeve dimensioned to sealingly receive into one end thereof the neck of the first container and into the opposite end thereof the neck of the second container, and having intermediate said opposite ends a transversely extending, peripherally continuous septum provided with a centrally positioned opening, said one end of said sleeve having an inwardly extending lip engaged behind said large diameter portion;

an elongated transfer spout having a first end to project into the second container and a second end to enter the first container through said stopper, said transfer spout having a portion intermediate said first and second ends sealingly retained in said septum opening and being provided with two substantially parallel passages extending longitudinally therethrough, the first and second ends of the transfer spout being bevelled so that the respective ends of the substantially parallel passages open into the bevelled ends at different longitudinal locations, wherein the bevelled second end of the transfer spout provides a piercing tip, and wherein said inwardly extending lip maintains said piercing tip from piercing engagement with said stopper of said first container before said first container is slid axially toward said piercing tip to allow mixing of the two container contents.

4,346,821

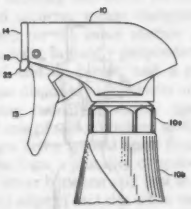
CHILD-RESISTANT CLOSURES FOR CONTAINER MOUNTED SPRAY DISPENSERS

Walter H. Wesner, Plantation, and Fred E. Wallace, Boca Raton, both of Fla., assignors to AFA Consolidated Corporation, Hialeah, Fla.

Continuation-in-part of Ser. No. 887,144, Mar. 16, 1978, abandoned. This application Jan. 31, 1979, Ser. No. 8,222

Int. Cl.³ B67D *5/42*

U.S. Cl. 222—153 **9 Claims**



1. An overcap for selectively closing and opening the outlet orifice of a liquid dispenser having a nose bushing in which said orifice is formed, said overcap being coupled to said nose bushing for sliding movement with respect thereto between a first or orifice closing position and a second or orifice opening position, said overcap including a first portion that is deflective with respect to said nose bushing and having detent means formed thereon, said detent means cooperating in a locking relationship with a surface of said nose bushing to hold said overcap against sliding movement when said overcap is in said first position, deflection of said portion of said overcap being operative to release said detent from locking relationship with said nose bushing whereby said overcap is movable to said second position from said first position, and wherein said overcap includes a second deflective portion spaced from said first deflective portion, said second deflective portion having a ramp surface provided thereon adjacent said nose bushing, said ramp surface cooperating with said nose bushing to produce an interference fit in the engagement of said orifice by said overcap as said overcap is moved from said second position to said first position.

4,346,822

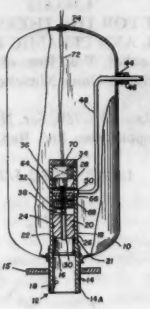
AIR BLASTER OR AIR ACCUMULATOR AND QUICK DUMP APPARATUS

Theodore S. Wadensten, Wyoming, and Alfred Carocci, Johnston, both of R.I., assignors to Vibco, Inc., Wyoming, R.I.

Division of Ser. No. 945,457, Sep. 25, 1978, Pat. No. 4,197,966. This application Dec. 13, 1979, Ser. No. 103,187

Int. Cl.³ B65D *88/72*

U.S. Cl. 222—195 **16 Claims**



1. An air accumulator and quick release apparatus for producing a blast of pressurized air into a storage bin for material, said apparatus including:

(a) a pressure tank and means for removably mounting said tank exterior of said bin, the pressure tank adapted to receive and store pressurized air, said tank having a large opening formed therein;

(b) a removable pipe mounted in said large opening and with said pipe having an open and a closed end and when mounted in said large opening the open end of the pipe is within the bin and adapted to direct the blast into the interior of the bin;

(c) a quick air release apparatus carried within said pipe and within said pressure tank when the pipe is mounted within the large opening of the pressure tank;

(d) a smoothly formed bore of regular diameter provided in the removable pipe;

(e) a front tubular stop carried within the bore in said pipe, said stop secured so that with the pipe mounted within the tank the extending open end of the pipe discharges the pressurized air within the bin and a rear end of the front tubular stop is within the tank;

(f) a multiplicity of discharge holes formed in the pipe, said holes arranged in a plane substantially transverse to the axis of the smoothly formed bore in the pipe and with the forward edges of these holes disposed toward the open end of the pipe and with said forward edges of the holes adjacent and inwardly of the rear end of the front tubular stop;

(g) a pipe piston slidable in said bore and sized so as to provide a minimum of air loss for and during movement of said piston in said smooth bore, a forward movement of the pipe piston established by the front stop, this forward movement of the piston as it engages this stop covering the discharge holes sufficiently to shut off the flow of pressurized air from the tank;

(h) means provided in the smooth bore of the pipe and limiting the rearward movement of the pipe piston and at this rearward limit of movement the discharge holes in the pipe are uncovered for a free flow of air from the tank to the interior of the pipe forwardly of the piston and from this pipe through the open end of the pipe and into the bin;

(i) a header member carried and mounted in the smooth bore of the pipe and rearwardly of the pipe piston, said header adapted to receive and deliver pressurized air to the interior portion of the pipe;

(j) a small rigid tube carried by the small header member, said small tube extending through an aperture central of the pipe piston, said tube disposed to carry pressurized air from the header member;

(k) an air conduit adapted to carry pressurized air from an external source outside of said pressure tank to and through said tank and to the header member thence to the interior of the small rigid tube;

(l) a piston carried in the bore of the small tube and reciprocably movable therein to forward and rear limits of movement;

(m) means for moving this small piston in the bore of this small tube to said two limits of movement;

(n) a small tubular seal having an opening therethrough, said tubular seal secured in the bore of the small tube, this tubular seal positioned in the tube so as to engage the face of the small piston at a forward limit of movement to effect a shut off of flow of pressurized air through the small tube and forwardly of the small piston;

(o) a plurality of outlet holes formed in the sidewall of the small tube, said plurality of outlet holes positioned so that at the forward limit of movement of the small piston the outlet holes in the small tube are uncovered allowing pressurized air to flow from the header member through the tube and then from the outlet holes into that portion of the pipe to the rear of the pipe piston, the pressurized air flowing into said pipe portion urging the pipe piston forwardly toward and to the front tubular stop in the pipe;

(p) a one-way valve provided in the pipe and adapted to permit flow of pressurized air from the interior portion of the pipe to the rear of the pipe piston and then through the one-way valve through conducting passageways to the interior of the pressure tank, the small piston in the rigid tube when moved from sealing engagement with the tubular seal in the small tube and to its rear limit of movement is rearwardly of the outlet holes in the small rigid tube and closes the small tube to the influent flow of pressurized air and opens that pipe area rearwardly of the pipe piston to allow the pressurized air in said portion to flow from this area through the plurality of outlet holes in the tube and through the tube to the open end of the pipe and into the bin to reduce a forward force on the piston, and,

(q) a complementary chamfer provided between the outer front edge of the pipe piston and the rear of the front tubular stop in the pipe, said chamfer providing a force surface upon which the pressurized air flowing from the tank impinges to urge the pipe piston rearwardly.

4,346,823

MULTIPLE FUNCTION CLOSURE

Lawrence C. Eppenbach, 419 Kennedy St., Juneau, Ak. 99801

Filed Aug. 4, 1980, Ser. No. 174,884
Int. Cl.³ G01F *11/26*
U.S. Cl. 222—443 **11 Claims**

1. A multiple-function closure for a container for divided material wherein the container has an opening, said closure comprising:

a first cap having an end wall and means for attaching the first cap to the container so that the end wall can at least partially span the opening of the container, said end wall having opening means extending therethrough;

a measuring unit;

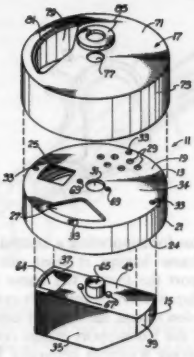
means for mounting the measuring unit on one side of the end wall;

said measuring unit having means responsive to the orientation of the measuring unit for measuring a predetermined volume of the divided material;

a first portion of said opening means communicating with the measuring unit so that said first portion can receive said predetermined volume of divided material from the measuring unit and a second portion of the opening means passing through said end wall so that said second portion cannot receive said predetermined volume of divided material from the measuring unit;

a second cap having an outlet therein; and

means for mounting said second cap on the other side of the first cap for movement relative to the first cap such that the outlet can selectively be placed in a position overlying



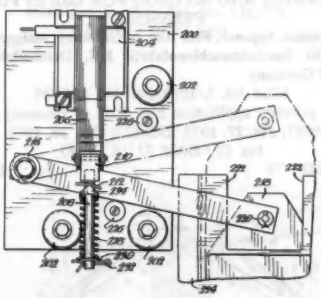
on imperforate portion of said end wall to define a closed position, or in communication with said first portion of said opening means to define a measured dispensing position, or in communication with said second portion of said opening means to define a non-measured dispensing position.

4,346,824

ICE DISPENSING MECHANISM

Benjamin D. Miller, and Albert L. Schafer, both of Chicago, Ill., assignors to Remcor Products Company, Franklin Park, Ill.

Filed Mar. 20, 1980, Ser. No. 131,990
Int. Cl.³ B67D *3/00*
U.S. Cl. 222—504 **6 Claims**



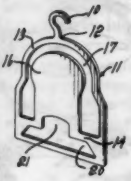
4. A mechanism for dispensing ice from a container having an opening accommodating passage of ice therethrough, said mechanism comprising gate means movable between a closed position for blocking the opening and an open position for unblocking the opening; a solenoid having a plunger movable between extended and retracted positions, and a spring coupling said plunger and said gate means, said plunger when retracted exerting forces on said spring to move said gate means to its open position and when extended relieving said spring of forces for return of said gate means to its closed position, said spring being placed under compression upon retraction of said plunger.

4,346,825

HAT SUPPORTING DEVICE

Jean-Paul Leger, 4776 Du Tremblay, Chomedey, Laval, Quebec H7W 2S9, Canada

Filed Oct. 15, 1979, Ser. No. 84,899
Claims priority, application Canada, Feb. 23, 1979, 322236
Int. Cl.³ A47F 7/19; A47J 51/086, 51/097
U.S. Cl. 223—66 13 Claims



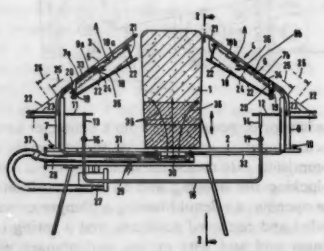
1. An apparatus for supporting a knitted soft hat and a scarf comprising a frame having at least one suspension means adapted to support the frame, the frame including a pair of outer laterally disposed frame members extending downwards from the suspension means, hat support means for supporting a knitted soft hat, the hat support means comprising a hat support member having a profile generally following the inner shape of a knitted soft hat and adapted to support a knitted soft hat below the suspension means, the hat support member including a pair of generally straight lateral edge portions joined by a central at least partially curved edge portion such that said edge portions form said profile, the lateral and central edge portions being spaced from the inner edges of said frame members an amount sufficient to permit a said soft knitted hat to be readily placed on said hat support member, and a scarf support means, located below hat support member, for supporting a scarf and including a horizontal bar portion which defines the lower edge of an opening of sufficient size to receive a scarf therein so that, in use, the said scarf is inserted into said opening and extends over said bar portion to be supported thereby, said scarf support means and said hat support means lying in the same plane and said apparatus including no moving parts.

4,346,826

APPARATUS AND METHOD FOR USE IN FINISH PRESSING

Gero Ehemann, Ippener, Fed. Rep. of Germany, assignor to Kurt Ehemann Spezialmaschinenfabrik KG, Delmenhorst, Fed. Rep. of Germany

Filed Jul. 7, 1980, Ser. No. 166,758
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1979, 2929057; Jul. 27, 1979, 2930622; Oct. 26, 1979, 2943420
Int. Cl.³ D06F 71/18, 71/40
U.S. Cl. 223—70 11 Claims



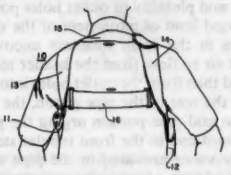
1. In combination with a dummy for use in finish pressing sweaters, jackets and similar garments, primarily made of knit fabric, consisting of a hollow body for the body portion and two pivot arms for the sleeves of the garment, which arms are pivotally mounted independently of the hollow body on the base support of the dummy, the improvement comprising first means for pivotally securing each of the pivot arms about a substantially perpendicular axis, and wherein the arms comprise a carrying rod, an air-pervious metal profile sheet and second means for hingedly mounting said profile sheet to said carrying rod so that the metal profile sheet is moved towards the carrying rod as said arms pivot about said perpendicular axis toward a first position.

4,346,827

VESTLIKE WEAPON CARRIER

John E. Bianchi, and Richard D. E. Nichols, both of Fallbrook, Calif., assignors to Bianchi Leather Products, Inc., Temecula, Calif.

Filed Dec. 5, 1980, Ser. No. 213,382
Int. Cl.³ A41D 1/04; F41C 33/00
U.S. Cl. 224—206 5 Claims



1. A vestlike handgun carrier comprising:
a holster body including a pair of spaced support points, one located in the muzzle and the second in the chamber region of a handgun carried in the holster body;
a first crescent shaped shoulder strap,
means securing the opposite ends of said shoulder strap to respective spaced support points of said holster body,
a second crescent shaped shoulder strap,
means connecting the ends of said second crescent shaped shoulder strap in the opposite underarm region of the wearer,
first broad area elastic means joining said first and second crescent shaped shoulder straps across the rear of the shoulders of the wearer below his collar,
second broad area elastic means joining said first and second crescent shaped shoulder straps across the back of the wearer,
said first and second joining means constituting the interconnection between said first and second crescent shaped shoulder straps;
said first and second crescent shaped shoulder straps and said first and second joining means defining a quadrilateral support structure for the holster capable of limited distortion with movement of the wearer while maintaining the holster and handgun therein in relatively stable position under the wearer's arm.

4,346,828

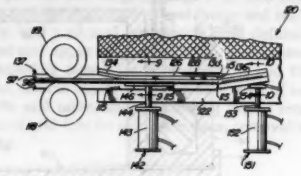
RAILROAD RAIL FRAGMENTING APPARATUS AND METHOD

Terrance V. Crawley, 30 Woodlawn Dr., Apt. A, Chattanooga, Tenn.

Filed Apr. 10, 1980, Ser. No. 138,974
Int. Cl.³ B26F 3/00
U.S. Cl. 225—2 14 Claims

1. Apparatus for fragmenting a rail having laterally outwardly extending base flanges, a wheel supporting head, and a web connecting said base flanges and said head, said apparatus comprising support means adapted to support said rail in an upright position so that the base flanges extend substantially horizontally, a pair of chisel members adapted to move in a plane extending generally transversely to said rail and into

engagement with the laterally outer side edges of the base flanges of said rail with sufficient force to insert a pair of laterally oppositely arranged notches in said flanges, the direction of movement of each of said chisel members being inclined at an angle of about 10 degrees above the horizontal when said



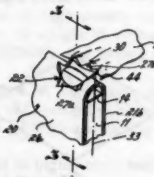
rail is supported in said upright position by said support means during notching, holding means adapted to engage a portion of said rail at one side of said notches and to prevent movement of said rail, and breaking means adapted to engage another portion of said rail at the other side of said notches and to bend said other portion until it breaks off.

4,346,829

ROLL DISPENSER CARTON

Daniel J. Myers, Cincinnati, Ohio, assignor to The Nivison-Weiskopf Co., Cincinnati, Ohio

Filed Sep. 2, 1980, Ser. No. 183,154
Int. Cl.³ B26D *1/02*
U.S. Cl. 225—48 **11 Claims**



1. A roll dispenser carton comprising

at least three panels joined one to the other in carton configuration, said carton being sized to receive a roll of sheet material therein, and said sheet material being withdrawable from said carton in a discharge direction, and

a cutting edge structure connected to at least one panel of said carton, said cutting edge structure comprising

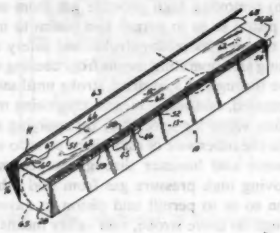
a series of buds extending outwardly from said panel, each of said buds comprising at least leading and trailing petals adapted to engage sheet material unwrapped from said roll for tearing a desired length of sheet material off said roll, said plural buds being positioned along at least one phantom line disposed generally perpendicular to the discharge direction of said sheet material from said carton, at least some of said leading petals cooperating to permit tearing of said desired sheet length from said roll and at least some of said trailing petals cooperating to cause the free end of sheet material still wrapped on said roll to remain attached to said cutting edge structure after said desired length is torn off when said sheet material is one of a polyethylene film and a film produced from a copolymer of vinylidine chloride and vinyl chloride.

4,346,830

DISPENSER CARTON

Donald P. Hauser, Cincinnati, Ohio, assignor to The C. W. Zumbiel Company, Cincinnati, Ohio

Filed Apr. 14, 1980, Ser. No. 140,223
Int. Cl.³ B26D *1/02*
U.S. Cl. 225—49 **19 Claims**



1. A carton comprising

two adjacent panels joined one to the other at a corner, said panels being formed from a one-piece blank, said panels being angularly disposed relative one to the other to define a phantom corner line at said corner,

a fold section located at said corner of said panels, said fold section being defined by a score line in said one-piece blank, and

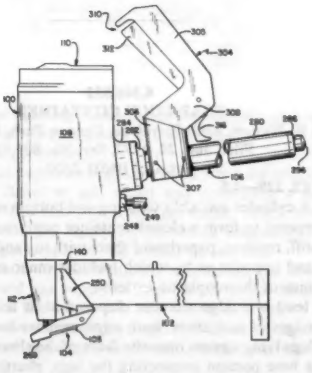
a cutting section located at said corner of said panels, said cutting section and said fold section being positioned generally in line one with another, said cutting section being formed from one of said panels by a cut line which extends completely through said one panel, said cutting section remaining integral with the other panel from which said cutting section was not formed, and said cutting section extending outwardly from said other panel beyond said phantom corner line.

4,346,831

PNEUMATIC FASTENING TOOLS

Harry M. Haytayan, Sunnyside La., Lincoln, Mass. 01773

Filed Jan. 9, 1980, Ser. No. 110,776
Int. Cl.³ B25C *1/04*
U.S. Cl. 227—8 **14 Claims**



1. In a fastener driving tool for holding and attaching parts to a workpiece, said tool comprising a driver and a parts holder attached to said driver;

said driver comprising a nozzle having a hammer travelway, means for positioning a fastener in said travelway, a hammer mounted for reciprocal movement along said travel-

way, a piston attached to said hammer, a cylinder slidably containing said piston, operating means for causing said hammer to move through a drive stroke and a return stroke along said travelway, said operating means comprising means including a control valve and means responsive to said control valve for selectively (a) applying a high pressure gas to one side of said piston so as to urge said piston to move said hammer through its drive stroke or (b) removing high pressure gas from said one side of said piston so as to permit said piston to move said hammer through its return stroke, and safety means for preventing said operating means from causing said hammer to move through its said drive stroke until said safety means is operated, said safety means comprising means including a safety valve for selectively (a) applying a high pressure gas to the other side of said piston so as to urge said piston to move said hammer through its return stroke or (b) removing high pressure gas from said other side of said piston so as to permit said piston to move said hammer through its drive stroke, said safety means comprising an actuating member arranged to operate said safety valve when said actuating member is depressed; and

said parts holder comprising a part support member adapted to support in the path of movement of said hammer a part intended to be fastened to a workpiece, and means movably supporting said part support member for movement toward and away from said nozzle so that when said part support member is engaged with a workpiece and moved toward said nozzle a selected amount, said actuating member will be depressed by said workpiece, said part support member or a part supported by said part support member, whereby said driver may be operated to drive a fastener out of said hammer travelway into a workpiece with said fastener penetrating the part held by said part support member as it is discharged from said travelway;

the improvement comprising a tool support member attached to and extending away from said housing; an operating rod slidably supported by said support member and adapted to engage and operate said control valve, force-transmitting means for moving said operating rod so as to engage and operate said control valve, and additional means for selectively preventing said operating rod from operating said control valve when said operating rod is moved by said force-transmitting means.

4,346,832

SNAP-LOCK CONTAINER

Jack R. Werner, 6500 Farralone, Canoga Park, Calif. 91304

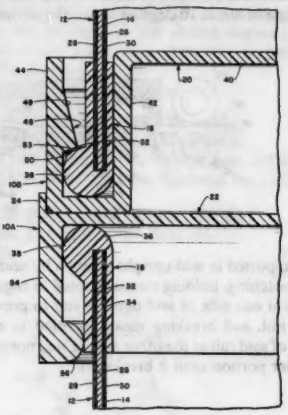
Filed Jun. 24, 1977, Ser. No. 809,617
Int. Cl.³ B65D *3/00*
U.S. Cl. 229—4.5 **15 Claims**

1. A cylinder assembly with top and bottom ends which can be covered to form a closed container comprising:

a stiff, resilient, paperboard sheet with top and bottom edges and opposite ends, which includes inner and outer coatings of thermoplastic material;

at least one edge member disposed at at least one of said edges of said sheet, each edge member having a pair of legs lying against opposite faces of the sheet structure and a base portion connecting the legs, abutting said top or bottom edge and formed with a radially, outwardly extending bead;

said sheet structure being formed into a largely cylindrical shape by wrapping said coated sheet into cylindrical shape with the opposite ends overlapped so that the inner and outer coatings are in contact and said inner and outer coatings being thermally fused together at the overlapped sheet ends; and



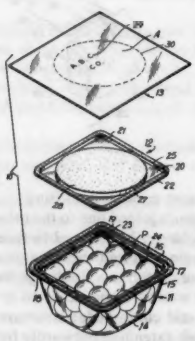
each of said edge members being formed of thermoplastic material with the legs thereof thermally fused to the inner and outer thermoplastic coatings of said sheet structure.

4,346,833

REPLACEABLE MULTIPLE SEAL PACKAGE

Daniel Bernhardt, P.O. Box 681, Rutland, Vt. 05701

Continuation-in-part of Ser. No. 175,367, Aug. 5, 1980, and Ser. No. 187,464, Sep. 15, 1980. This application Mar. 30, 1981, Ser. No. 248,996
Int. Cl.³ B65D *5/64, 43/00*
U.S. Cl. 229—43 **14 Claims**



1. A recloseable multiple seal package for food or the like comprising a container having a bottom and side wall portions extending upwardly from said bottom, the upper ends of said wall portions defining an open mouth portion, a laterally directed ledge member extending outwardly from the upper extremity of said side wall portions, a rim member extending upwardly from the outer extremity of said ledge member, and an outwardly directed perimetrical flange extending from the upper extremity of said rim, said flange and ledge being vertically offset, a cap member disposed in closing position of said mouth portion, said cap member including a depending skirt disposed within said container and frictionally engaging the inner faces of said side wall portions, a laterally outwardly directed shoulder extending from said skirt, said shoulder overlying said ledge member and having an upper surface in

substantial coplanar alignment with the upper surface of said flange, a raised table portion formed on said cap member within the area defined by said skirt, said table portion including an upper planar face portion in substantial coplanar alignment with said upper surface of said flange, a resilient closure film in registry with said flange, first and second substantially continuous perimetrical seal connections defined between said film and the said upper surface of said flange and said shoulder, respectively, and a central connection area defined between said film and said upper face of said table, said central connection area including means for securement of said film to said cap member, indicia means on the central area of said film in registry with said table, said securement means retaining the central area of said film on said table upon removal of the film from the cap.

4,346,834

THERMOPLASTIC CARRYING BAG WITH POLYOLEFIN RESIN BLEND

Ranjit Mazumdar, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 18, 1980, Ser. No. 208,092
Int. Cl.³ B65D *30/00*; B32B *27/00*
U.S. Cl. 229—54 R **8 Claims**

1. A thermoplastic polyolefin film having heat sealing properties and comprising a blend of

(a) 5 to 20 weight % high density copolymer of ethylene with about 1 to 10 weight % alpha-olefin having 6 to 8 carbon atoms (HDPE), and having a melt index of 0.2 to 2;

(b) 20 to 70 weight % linear low density copolymer of ethylene with 1 to 10 weight % alpha-olefin having 4 to 12 carbon atoms (LLDPE), and having a melt index of 0.2 to 2; and

(c) 20 to 70 weight % highly branched low density ethylene homopolymer (LDPE) having a fractional melt index of 0.5 to 0.9.

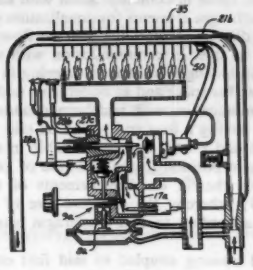
4,346,835

INSTANTANEOUS WATER HEATER GAS CONTROL VALVE

Albin Trotter, and Ursus Trotter, both of Karen 2908, Las Cruces, N. Mex. 88001

Filed Apr. 8, 1981, Ser. No. 252,218
Int. Cl.³ F28F *27/00*
U.S. Cl. 236—24 **5 Claims**

1. An improved water operated control valve for controlling and modulating the flow of gas to the burner of an instantaneous water heater, the control valve comprising a water controlled diaphragm actuator, and a multi-chamber gas valve assembly comprising a spring-biased valve means operated by a rod connected to a resilient diaphragm of the water controlled actuator and which separates the actuator into first and second chambers, said chamber being fluid connected respectively to the throat and inlet of a venturi-restrictor inserted in the water inlet duct of the water heater, and wherein the gas valve assembly comprises an inlet chamber connected to a gas duct, a first intermediate chamber connected to the inlet chamber by means of a thermostatic valve, a second intermediate chamber connected to the first intermediate chamber through a gas flow limiter operated by a settable temperature controller, and an outlet chamber separated from the second intermediate chamber by said spring biased valve means operated by



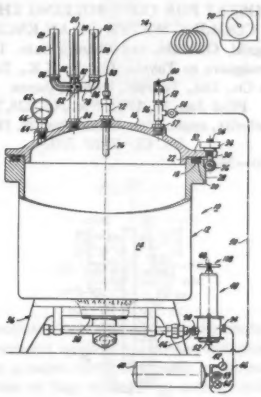
the rod connected to the diaphragm of the water controlled actuator.

4,346,836

PRESSURE COOKER CANNING UNIT

Louis F. Nagel, P.O. Box 1767, Oakland, Calif. 94604

Continuation of Ser. No. 814,729, Jul. 11, 1977, abandoned. This application Jan. 2, 1979, Ser. No. 178
Int. Cl.³ F22B *35/00*
U.S. Cl. 236—26 A **11 Claims**



1. A pressure cooking canning unit for canning with saturated steam pressure comprising in combustion:

a. a pressurizable retort;

b. a gas burner means arranged with said retort for providing a heating flame to said retort and generating a steam pressure within said retort, said gas burner means having a combustible gas supply for providing combustible gas from said gas supply to said burner means; and

c. control means for automatically modulating the flow of gas from said gas supply to said burner means in direct accord with the steam pressure within said retort, said control means comprising a diaphragm actuated regulator between said gas supply and said burner, said regulator having:

1. a core housing with first and second ends with a first diaphragm element sealing said first end of said housing, a second diaphragm element sealing said second end of said housing, connecting means for rigidly connecting said first and second diaphragm elements into a diaphragm assembly wherein said first and second diaphragm ele-

ments are displaceable in unison, a gas flow passage through said core housing between said first and second diaphragm elements wherein said gas passage has a gas chamber space in communication with said first and second diaphragm elements for equalization of gas pressures on said diaphragm elements, said gas flow passage having further an inlet in communication with said gas supply, said inlet having a constricted opening in said housing to said chamber space and an outlet from said chamber space in communication with said burner means, and, a single poppet having a base end seated on said first diaphragm element and a nose end positionable in said constricted opening in position to the direction of gas flow and displaceable therein on displacements of said diaphragm assembly whereby the effective size of the opening is varied according to said diaphragm assembly displacements;

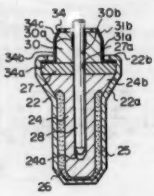
2. an end housing coupled to said first end of said core housing constructed to form a steam pressure chamber in conjunction with said first diaphragm element opposite said gas chamber space, said end housing having a steam inlet in communication with said retort; and,
3. a spring housing coupled to said second end of said core housing with an internal spring element operably engaging said second diaphragm element opposite said gas chamber space, said spring housing having further spring compression adjusting means for adjusting the effective compression bias of said spring element as applied against said second diaphragm element.

4,346,837

THERMOSTAT FOR CONTROLLING THE FLOW OF COOLING WATER OF AN ENGINE

Masao Inagaki, Okazaki, and Shigeru Sato, Togoshi, both of Japan, assignors to Toyota Jidosha K.K., Toyota and Fuji-Thomson Co., Ltd., Togoshi, both of, Japan

Filed Jan. 27, 1981, Ser. No. 228,733
Claims priority, application Japan, Jan. 29, 1980, 55/8458[U]
Int. Cl.³ F01P 7/02
U.S. Cl. 236—34.5 **11 Claims**



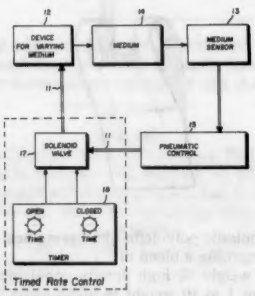
1. A thermostat arranged in a coolant passage of an internal combustion engine, said thermostat comprising a casing stationarily arranged in the coolant passage, a valve which normally shuts off the coolant passage, a wax container which contains therein an expansible wax sensitive to temperature and is connected to the valve, and a drive rod which has an inner portion slidably inserted into the wax container and has an outer portion projecting outwardly from an end face of said wax container and connected to the casing, the drive rod projecting due to the expanding operation of the wax for actuating the valve to open the coolant passage when the temperature of the coolant reaches a predetermined temperature, the improvement wherein said thermostat comprises a sealing sleeve made of an elastic material and having a hole through which the drive rod passes, and a generally hollow cylindrical spring cap enclosing said sealing sleeve and contacting an outer circumferential wall of said sealing sleeve for pressing an inner wall of the hole of said sealing sleeve onto the drive rod due to the spring force of said spring cap, the inner wall of the hole of said sealing sleeve having a plurality of triangular shaped projections formed thereon at a position remote from the end face of the wax container, and said sealing sleeve having an inwardly slanted circumferential wall located around said triangular shaped projections, said spring cap having a resilient inwardly slanted portion which resiliently contacts the inwardly slanted outer circumferential wall of said sealing sleeve for pressing said triangular shaped projections onto the drive rod due to the resilient force of said resilient inwardly slanted portion.

4,346,838

TIMED RATE PNEUMATIC CONTROL

William L. Mayo, 200 Lake Rd., E. Fork, Hamlin, N.Y. 14464

Filed Feb. 12, 1981, Ser. No. 233,874
Int. Cl.³ G05D 23/32
U.S. Cl. 236—46 R **14 Claims**



1. A timed rate control for a system that includes a multiposition device for varying a medium, a sensor and a controller arranged for detecting variation in said medium and applying to said multiposition device a pneumatic pressure that varies as a function of the detected medium variation to adjust the position of said device to alter said medium, and a pneumatic line arranged for transmitting said variable pneumatic pressure from said controller to said multiposition device, said timed rate control comprising:

a. a solenoid valve operably arranged in said pneumatic line between said controller and said device;
b. said solenoid valve having a closed state blocking transmission of pneumatic pressure from said controller to said device and effectively holding said device in a position determined by pneumatic pressure in said pneumatic line between said device and said closed solenoid valve;
c. said solenoid valve having an open state opening said pneumatic line to apply said variable pressure from said controller to said device to adjust the position of said device as a function of air pressure from said controller during said open state of said solenoid valve;
d. a timer setable for variably determining both an interval for said closed state and an interval for said open state of said solenoid valve to establish a timed rate for controlling said multiposition device; and
e. said timer being connected to said solenoid valve to operate said solenoid valve alternately in said closed state and open state intervals while said system operates to adjust the position of said multiposition device during said open state intervals and to hold an adjusted position of said multiposition device during said closed state intervals.

4,346,839

SYSTEM FOR HEATING THE SERVICE CABIN OF A MOTOR VEHICLE

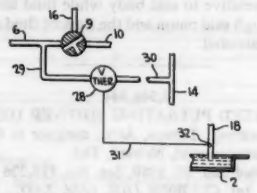
Gottfried Moser, Gladbach, Fed. Rep. of Germany, assignor to Klockner-Humboldt-Deutz AG, Cologne, Fed. Rep. of Germany

Filed Feb. 25, 1980, Ser. No. 123,944

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1979, 2928999

Int. Cl.³ B60H 1/02

U.S. Cl. 237—12.3 R 2 Claims



1. A system for heating the service cabin of a motor vehicle having a work implement thereon for use such as in agriculture or earth moving, comprising a hydraulic pump for feeding oil under pressure from an oil reservoir associated with the vehicle and through an oil conduit system back to the reservoir, a hydraulic apparatus provided for operating the work implement being coupled into the oil conduit system for heating the oil passing therethrough, a throttling element having a fixed throttled cross-section coupled into the oil conduit system in parallel to said hydraulic apparatus for heating the oil passing therethrough, manually operable valve means in the oil conduit system upstream of said hydraulic apparatus and said throttling element for selectively valving the oil to said hydraulic apparatus and/or to said throttling element, a heat exchanger coupled into the oil conduit system downstream of said hydraulic apparatus and said throttling element for heating the service cabin area, said heat exchanger having an oil return line downstream thereof extending into the reservoir, the oil conduit system having a line by-passing said valve means and being connected upstream of said heat exchanger, a thermostatic valve in said by-pass line, and a thermostat operatively connecting said thermostatic valve and said return line from said heat exchanger for heat sensing the oil from said heat exchanger before reaching said oil reservoir, whereby the flow of oil may be selectively directed by operation of said manually operable valve means through said throttling element and/or through said hydraulic apparatus or only through said by-pass line depending on the temperature sensed by said thermostat for thereby regulating the temperature of said heat exchanger.

4,346,840

VOLATILE DISPENSING COMPOSITION AND METHOD

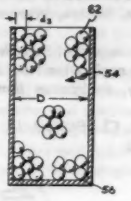
Laurel A. Gaiser, 2528 Fifth Ave., Sacramento, Calif. 95818, and Conrad J. Gaiser, P.O. Box 534, Zephyr Cove, Nev. 89448

Continuation-in-part of Ser. No. 742,560, Nov. 17, 1976, abandoned. This application Aug. 17, 1979, Ser. No. 67,340

Int. Cl.³ A61L 9/04

U.S. Cl. 239—6 12 Claims

1. A method of providing a plurality of volatile-dispensing products of the same volatile-dispensing composition and bulk volume but with varied volatility which comprises adsorbing the volatile-dispensing composition onto a plurality of varied size range fractions of an inert solid adsorbent carrier of spherical or substantially spherical particles and packaging each of the resultant adsorbate-solid fractions of varied particle size range into containers having a cross-sectional diagonal at least



about 5 times the average particle diameter of said adsorbent particles.

4,346,841

FUEL INJECTION NOZZLE UNIT

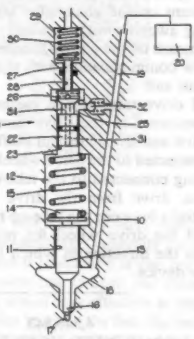
Ivor Fenne, Greenford, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jan. 13, 1981, Ser. No. 224,696

Claims priority, application United Kingdom, Feb. 2, 1980, 8003564

Int. Cl.³ F02M 47/02

U.S. Cl. 239—125 4 Claims

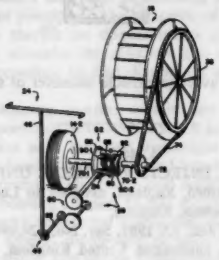


1. A fuel injection nozzle unit of the kind intended to supply fuel to a compression ignition engine and comprising a body defining a bore, a valve member slidable in the bore for controlling the flow of fuel through an outlet, resilient means loading the valve member in a direction to prevent flow of fuel through the outlet, said resilient means being located within a chamber defined in the body and into which fuel can leak from the working clearance defined between the valve member and the wall of the bore, means for draining fuel from said chamber the body defining an inlet for liquid fuel under pressure, the pressure of fuel in use, acting on the valve member to lift the valve member against the action of the resilient means, the means for draining fuel from said chamber comprising a relief valve including a valve element having one surface exposed to the pressure in the chamber and an opposing surface which is exposed to the pressure exterior of the nozzle unit, resilient means biassing the valve element to a closed position, the pressure in said chamber acting upon said one surface to move the valve element to an open position to allow fuel to flow to said fuel inlet and a non-return valve, through which the fuel flows to said inlet, the pressure required to move said valve element to the open position being greater than the sum of the maximum residual pressure at the fuel inlet when in use the delivery of fuel has ceased, and the pressure required to open the non-return valve.

4,346,842
IRRIGATION DEVICE AND A METHOD OF OPERATING SUCH DEVICE

Theunis C. Botha, Stettyn, Worcester, Cape Province, South Africa

Continuation-in-part of Ser. No. 10,933, Feb. 9, 1979, abandoned. This application Nov. 21, 1980, Ser. No. 209,203
Claims priority, application South Africa, Feb. 22, 1978, 78/1038
Int. Cl.³ B05B 3/18; A01G 25/09
U.S. Cl. 239—183 **9 Claims**

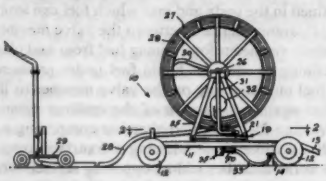


1. A self-propelled irrigation device which comprises:
a wheeled chassis having at least one drive wheel;
take-up means on the chassis for taking up a supply hose extending away from the device;
irrigation means on the chassis, connected or connectable in fluid flow communication with the supply hose;
drive means; and
differential drive transmission means comprising an input shaft connected to the drive means, and differentially-driven first and second output shafts, the first output shaft being connected to the drive wheel and the second output shaft being connected to the take-up means, whereby, in operation, drive from the drive means is apportioned differentially between the take-up means for taking up the hose and the drive wheel for propelling the irrigation device in the direction in which the hose extends away from the device.

4,346,843
PIVOTALLY MOUNTED HOSE REEL FRAME FOR IRRIGATION MACHINE

Z. Vance Long, and Elvin F. Barwick, both of Tarboro, N.C., assignors to Long Mfg. N.C., Inc., Tarboro, N.C.

Filed Jun. 30, 1980, Ser. No. 164,384
Int. Cl.³ B05H 75/00
U.S. Cl. 239—199 **2 Claims**

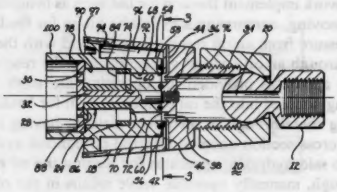


1. In an irrigation machine, a rotary union for use in a high pressure fluid line having a predetermined inner diameter comprising a body, said body including a ring member having an inner diameter which is at least substantially as large as the inner diameter of said fluid line and a bottom member, a plurality of post means disposed outwardly of the inner diameter of said fluid line and connecting said ring member to said bottom member in fixed spaced relationship with each other, sleeve means disposed about said ring member and said bottom member, seal means connecting said sleeve means to said ring member and said bottom member to permit said sleeve means to rotate relative to said body while substantially preventing the escape of fluid from said body, means for connecting a first portion of said fluid line to said ring member in axial alignment with the inner diameter thereof, and means for connecting a second portion of said fluid line to said sleeve means in a position to introduce fluid into said body between said ring member and said bottom member, whereby substantially no thrust load is applied to said rotary union so that said sleeve means is freely rotated relative to said body while fluid under pressure is passing through said union and the flow of fluid through said union is not restricted.

4,346,844
AERATED PULSATING SHOWER HEAD

Richard C. Harmony, Tucson, Ariz., assignor to Conservation Associates Incorporated, Newark, Del.

Filed Jan. 28, 1980, Ser. No. 116,226
Int. Cl.³ B05B 1/08, 1/18, 7/00
U.S. Cl. 239—383 **9 Claims**



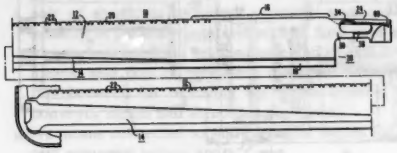
1. An aerated pulsating shower head connectable to a source of water under pressure, said shower head comprising in combination:
(a) an outer shell, said outer shell including a first chamber for receiving the water under pressure and a second chamber;
(b) a pair of diametrically opposed passageways disposed in said outer shell and interconnecting said first and second chambers, each of said pair of passageways including an outlet disposed in said second chamber;
(c) means for aerating the water flowing through at least one of said passageways;
(d) an inner shell disposed within said second chamber, said inner shell being positionally rotatable with respect to said outer shell, said inner shell including a third chamber;
(e) a pair of further passageways extending from said one end of said inner shell into said third chamber, each said further passageway including an inlet positionable coincident with an outlet of said pair of passageways in said outer shell;
(f) means disposed in said one end for directing a proportionate flow of water from at least one of said pair of passageways into said second chamber and through at least one of said further passageways into said third chamber, depending upon the relative rotational position of said inner shell with respect to said outer shell;
(g) a rotor rotatably mounted within said third chamber, said rotor being rotationally responsive to the flow of water through said further passageways into said third chamber;
(h) a disc having a pattern of discharge ports for discharging water from said third chamber;
(i) a chopper operatively associated with said rotor for intermittently terminating water flow through some of said discharge ports to produce a pulsating water spray; and
(j) a plurality of grooves interconnected with said second chamber for discharging water as a spray from said second chamber.

4,346,845

GAS BURNER

Alfred Meyerhoff, Hempfield Township, Westmoreland County; John C. Kastovich, Murrysville; James A. Richard, Monroeville, all of Pa., and Richard J. Vales, Elyria, Ohio, assignors to York-Luxaire, Inc., Elyria, Ohio

Filed Aug. 7, 1980, Ser. No. 175,973
Int. Cl.³ F23D *15/00*
U.S. Cl. 239—418 4 Claims



1. In combination:

a one-piece gas burner member formed of a single, monolithic metal sheet, said member including a tubular portion with an upstream, generally open gas and primary air receiving end, an opposite closed end, and port means in the upper portion of a part of said tubular portion;

the upstream portion of said member being of generally cylindrical shape in cross section for at least a minor part of the length of said tubular portion and including at the upstream end of said upstream portion a shaped part which is downwardly open from about the horizontal mid-plane of said cylindrical shape, the upper quadrant walls of said shaped part including at least one opening therein for the admission of part of the inlet air to said member, said shaped part having a downwardly-open, saddle-shaped, upstream end adapted to be received on the circumference of a gas spud; and

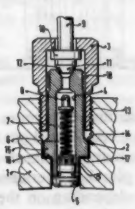
a primary air shutter of substantially uniform cylindrical shape throughout a major portion of its length and of a circumferential inner dimension to telescopically fit around said cylindrical shape of said upstream portion of said member and around said shaped part, said shutter having a converging tube-shaped entry at its upstream end through which primary air is admitted to said member, said shutter being longitudinally slidable to vary the admission of said primary air.

4,346,846

FUEL INJECTION NOZZLE

Ewald Eblen, Stuttgart, and Karl Hofmann, Remseck, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 42,259, May 24, 1979, abandoned. This application Dec. 5, 1980, Ser. No. 213,714
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1978, 2826038
Int. Cl.³ F02M *61/16*
U.S. Cl. 239—533.3 9 Claims



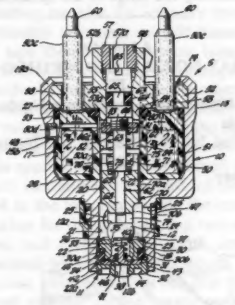
1. Fuel injection nozzle having a fuel inlet end and a fuel injection end for internal combustion engines arranged to be supported in a bore of the internal combustion engine, further including a nozzle holder, said nozzle holder including an axially aligned bore therein and extraction means on its upper extremity for removal of said nozzle holder from said bore of said internal combustion engine, said extraction means including at least one groove in said upper extremity, a preassembled valve module secured in the bore of said nozzle holder from the injection side of said injection nozzle and an exteriorly threaded cap for clamping a fuel feed line to said nozzle holder, further wherein said internal combustion engine bore is threaded and arranged to receive said exteriorly threaded cap whereby said fuel feed line is clamped to said nozzle holder in an end-to-end pressure-tight fit and said nozzle holder is locked in said bore of said internal combustion engine.

4,346,847

ELECTROMAGNETIC FUEL INJECTOR WITH ADJUSTABLE ARMATURE SPRING

Paul Rissi, Grand Rapids, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 21, 1980, Ser. No. 170,734
Int. Cl.³ F02M *51/06*
U.S. Cl. 239—585 2 Claims



1. An electromagnetic fuel injection valve having a housing with a solenoid pole piece defining a generally cylindrical bore within which an armature is positioned at one end thereof for opening and closing movements to open and close a fuel discharge passage, a spring in said bore effective at one end to bias the armature in a direction to close the fuel discharge passage, adjustable stop elements seating against the other end of said spring, said stop elements including a nut having an annular face in engagement with the spring and noncircular confirmations extending outboard said face, said housing defining axially oriented slots receiving said conformations and restraining the nut against rotation, a guide pin extending axially of and telescoped with said bore, said spring and said armature and threadedly receiving the nut, said guide pin having an externally accessible driver-receiving head, said guide pin further having an abutment shoulder engageable with the armature whereby to fix the extent of armature movement in the spring compressing direction and an abutment screw adjustably threaded in said bore of said housing for abutment against said head of said guide pin whereby to retain said guide pin against axial movement in one direction.

4,346,848

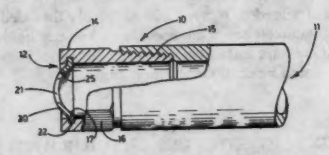
NOZZLE WITH ORIFICE PLATE INSERT

William R. Malcolm, 2281 N. Piedra Rd., Sanger, Calif. 93657

Continuation of Ser. No. 74,722, Sep. 12, 1979, abandoned, which is a continuation of Ser. No. 930,904, Aug. 4, 1978, abandoned. This application Oct. 29, 1980, Ser. No. 201,708
Int. Cl.³ B05B *1/02*
U.S. Cl. 239—596 6 Claims

1. An orifice plate for a sprinkler having a nozzle for release of a fluid stream from the sprinkler along a prdetermined

substantially straight path, the orifice plate comprising a member having a concave surface, a periphery dimensioned to permit the member to be mounted on the nozzle transversely of the predetermined path with said concave surface facing inwardly of the sprinkler and an orifice extending through the member in a position to be substantially centrally disposed with respect to the predetermined path when the member is



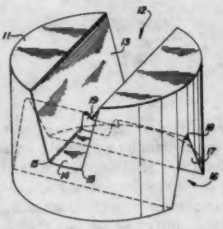
mounted on the nozzle, the orifice having a periphery with at least three angular corners arranged in a pattern extending radially away from and substantially symmetrical to said path to break away outer portions of the fluid stream from the main body of the fluid stream for precipitation nearer to the sprinkler than the fluid of said main body of the fluid stream without substantially reducing the range of the sprinkler.

4,346,849

AIRLESS SPRAY NOZZLE AND METHOD OF MAKING IT

Alvin A. Rood, Oberlin, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Jul. 19, 1976, Ser. No. 706,361
Int. Cl.³ B05B *1/00*
U.S. Cl. 239—597 **42 Claims**



1. An airless spray nozzle comprising a tip having an orifice formed by a first groove on a first side of the tip, with side walls which make the groove substantially wedge-shaped at the bottom; and

an interpenetrating second groove on a second side of the tip opposed to the first side, said second groove being substantially trapezoid shaped with a substantially flat bottom and with side walls angled away from the bottom of said second groove;

wherein the spray tip produces a flat fan spray pattern of liquid when the tip is connected to a source of fluid under pressure.

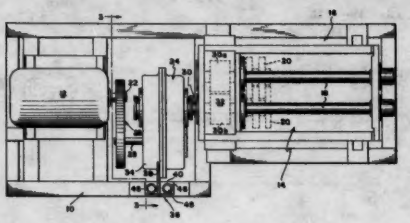
4,346,850

SHREDDING MACHINE INCORPORATING A TORQUE CUSHIONING ASSEMBLY

Carl Westergaard, Palatine, Ill., assignor to Mitts & Merrill Inc., Saginaw, Mich.

Filed Aug. 18, 1980, Ser. No. 179,068
Int. Cl.³ B02C *18/20*
U.S. Cl. 241—36 **6 Claims**

1. In a shredding machine having a frame defining a shredding chamber, rotatable comminuting mechanism having knife means mounted in said chamber and operable when rotated to shred material fed into said chamber, drive means including a reversible drive motor operatively coupled to said comminuting means, and torque responsive means for reversing the direction of rotation of said drive motor in response to an overload on said comminuting means; the improvement wherein said drive means comprises drive transmission means drivingly coupling said motor to said comminuting means, said



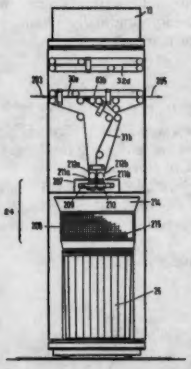
transmission means including a casing, a first rotatable shaft projecting from said casing, said first shaft being rotatably journaled in said frame and coupled to said comminuting means to constitute the drive shaft therefor, and resilient means mounted on said frame and engaged with said casing for resiliently resisting rotative movement of said casing bodily relative to said frame about the axis of said first shaft.

4,346,851

DEVICE FOR AUTOMATICALLY SHREDDING THIN SHEETS

Herbert Bernardi, Haag, and Gerd von Aschwege, Munich, both of Fed. Rep. of Germany, assignors to G.A.O. Gesellschaft für Automation und Organisation mbH, Fed. Rep. of Germany

Division of Ser. No. 867,011, Jan. 5, 1978, Pat. No. 4,236,639.
This application Jan. 24, 1980, Ser. No. 115,120
Claims priority, application Fed. Rep. of Germany, May 1, 1977, 2729830
Int. Cl.³ B02C *4/42*
U.S. Cl. 241—159 **6 Claims**



1. In a device for shredding thin paper sheets, such as bank notes, which sheets have been sorted out in an automatic sorting device in which the individual sheets are withdrawn from a stack, are tested for a plurality of criteria and are assigned to certain sorting classes, depending on the test results, one of these sorting classes being that of genuine bank notes which are no longer fit for circulation, an improvement comprising:

a housing having an inlet opening for sequentially receiving the sheets and an outlet opening;

means within said housing for transporting the sheets

through a first feed path between said inlet and said outlet openings;

conveyor means movably mounted in said housing having one end disposed along said first path for selectively receiving and directing sheets through a second path to an opposite end of said conveyor means, said conveyor means having end rollers at its opposite end;

sorting means connected to said means for transporting the sheets for selecting sheets to be received by said conveyor means;

a pair of shredding cylinders rotatably mounted in said housing in parallel along said second feed path and at a location spaced from said opposite end of said conveyor means, said pair of shredding cylinders defining a nip therebetween for receiving the sheets directed by said conveyor means and shredding the sheets;

drive means connected to said conveyor means for driving said conveyor means; and

bridging elements connected between said pair of shredding cylinders and said conveyor means and rollers for confining and establishing a closed continuous transition in said second feed path between said conveyor means and said nip;

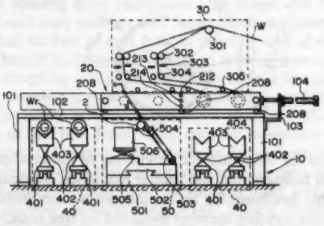
said drive means of said conveyor means operable to also drive said shredding cylinders.

4,346,852

WEB WINDING DEVICE

Ken Kawada, and Kazumasa Harada, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 24, 1980, Ser. No. 200,358
Claims priority, application Japan, Oct. 26, 1979, 54-13854
Int. Cl.³ B65H *35/02, 19/04*
U.S. Cl. 242—56.2 **7 Claims**



1. A web winding device for continuously winding web segments produced by slitting a web comprising:

a stationary frame;

a first web winding and product discharging station, a core supplying and web attaching station, and a second web winding and product discharging station arranged side-by-side in said stationary frame in the stated order; and

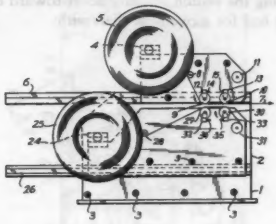
a winding unit having two web winding means which are coupled together extending in the longitudinal direction of said web, each of said web winding means being adapted to hold a core for a corresponding one of said web segments and to rotate said cores to cause said web segments to be wound thereon, said winding unit being reciprocatably mounted on said stationary frame in such a manner that said winding unit is reciprocatable over said stations.

4,346,853

UNWINDING MACHINE

Romano Stefanoni, Via Fiume 10, Nova Milanese (Milano), and Eliseo Annoni, Via Fratellanza 4, Bollate (Milano), both of Italy

Continuation-in-part of Ser. No. 70,824, Aug. 29, 1979, abandoned. This application Aug. 8, 1980, Ser. No. 176,560
Int. Cl.³ B65H *19/18, 19/20*
U.S. Cl. 242—58.1 **10 Claims**



1. An unwinding machine for adhesive tapes comprising a frame, two rotatable tape reels on said frame for successive unwinding of tape therefrom, a driving launching roller for each reel, one reel being unwound by pulling on the tape from a location outside the machine while the other reel serves as a spare and is at rest, the driving launching roller associated with the spare reel being operated to engage the end of tape therefrom to unwind the tape from the spare reel when the tape on said one reel is approaching the end thereof, first and second rollers for each reel adjacent the path of the tape from the respective reel to the location outside the machine, said first and second rollers for the reels defining two opposed straight travel sections, and cutting means with eccentric pressing members associated with said first and second rollers such that the cutting means associated with the first roller of the reel being unwound and the cutting means associated with the second roller of the spare reel are simultaneously operated when the speeds of the two reels are the same to cause the tape from the reel being unwound to be cut while the tape leading to the launching roller from the spare reel is cut while simultaneously the cut end of the tape from the spare wheel is joined to the cut end of the tape extending to the location outside the machine, the joinder being effected in said travel section by said eccentric pressing members.

4,346,854

PRINTER PAPER TAKE-UP AND STORAGE DEVICE

Lawrence W. Markus, Lake Bluff; George Smejkal, Mt. Prospect, and Melvin A. Lace, Prospect Heights, all of Ill., assignors to Extel Corporation, Northbrook, Ill.

Filed Oct. 24, 1980, Ser. No. 200,603
Int. Cl.³ B65H *17/02, 25/22, 75/18*
U.S. Cl. 242—67.1 R **7 Claims**

1. In a paper take-up and storage device adapted for use with a printer of the kind employing a paper web as a record medium, the printer including a paper drive for advancing the record-bearing paper web out of the printer, and requiring the paper drive to effect a reverse movement of a limited length of the web back into the printer for a given printer operating condition, the take-up and storage device comprising:

a paper web storage reel;

a reel drive motor for rotating the reel;

a control switch connected in an energizing circuit for the motor;

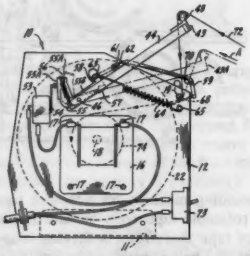
a guide bail, extending transversely of the reel in position to engage the paper web ahead of the reel, the bail being pivotally movable from a home position into a range of deflected positions in response to take-up of the web onto the reel;

bail bias means urging the bail towards its home position;

and an actuator lever aligned with the bail and the control switch and pivotally movable from a take-up position, in which the actuator lever effectively actuates the control switch to energize the motor, to a range of inactive positions in which the actuator lever effectively actuates the control switch to de-energize the motor in response to positioning of the bail in its deflected position range;

the improved construction comprising:

actuator bias means linking the actuator lever and the bail and biasing the switch actuator lever toward engagement with the bail for movement therewith;



a paper presence sensor arm aligned with the actuator lever and positioned to engage the web adjacent the reel, the presence sensor arm being movable, by the web, from a no-paper position, in which it holds the actuator lever in its range of inactive positions independently of the position of the bail, to a paper-present position in which the sensor arm is effectively released from the actuator lever so that the lever follows the bail:

and paper presence bias means biasing the presence sensor arm toward its no-paper position;

essentially the only force opposing reverse movement of the web through said limited length being a limited bias force applied to the bail by the bail bias means.

4,346,855

STRIPPING METHOD AND APPARATUS FOR THE PROCESSING OF A CONTINUOUS LAMINATED WEB

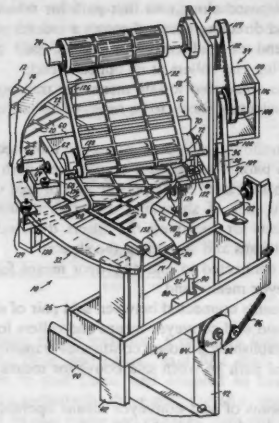
Frank M. Biggar, III, Lakeview, N.Y., assignor to Elizabeth S. Biggar, Hamburg, N.Y.

Filed Jul. 24, 1980, Ser. No. 172,026

Int. Cl.³ B65H *17/02, 17/20, 27/00*

U.S. Cl. 242—67.2 **43 Claims**

1. In a machine for the processing of a continuous laminated web, such as in the production of labels and the like, where the laminae is die cut to define a matrix portion to be separated from a substrate, a stripper apparatus for separating the matrix from the substrate as the web travels, said apparatus compris-



ing: means for separating the matrix at a skewing angle relative the web, as the web travels.

4,346,856

DEVICE FOR AUTOMATIC REWINDING OF MATERIAL DELIVERED IN SHEETS IN HELIOGRAPHIC AND SIMILAR MACHINES

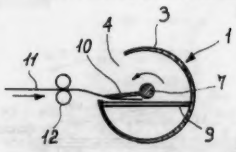
Fausto Paietta, Bareggio, Italy, assignor to C.M.E. F. Lli Paietta, Bareggio, Italy

Filed Oct. 28, 1980, Ser. No. 201,612

Claims priority, application Italy, Oct. 30, 1979, 26919 A/79

Int. Cl.³ B65H *75/28*

U.S. Cl. 242—74 **11 Claims**



1. Device for the automatic rewinding of material delivered in sheets in heliographic and similar machines, particularly for heliographic machines for textile industries, comprising:

at least one winding member mounted for free rotation about an axis, said winding member comprising a substantially cylindrical hollow casing presenting a substantially C-shaped cross section and defining a lengthwise slot extending along substantially the entire length of said hollow casing; and

a motor-driven shaft mounted within said hollow casing coaxially with the axis of said winding member and provided with suitable means for securing the leading edge of a sheet to be rewound to said hollow casing after insertion of said sheet through said slot, said shaft, after securing of the leading edge, pulling round said hollow casing, in order to wind the sheet around the casing, said shaft extending substantially all along the entire length of said hollow casing, said means for securing the leading edge comprising a plurality of radial tabs fitted onto said shaft at intervals along the length of the aforesaid shaft, said shaft and tabs being rotatable within said hollow casing, corresonding elements being provided within said hollow

casing for cooperating with said tabs to secure said leading edge between the tabs and said corresponding elements.

4,346,857

FISHING REEL

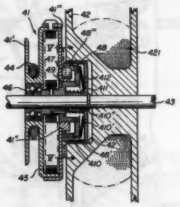
Robert Moll, Cheserex, Switzerland, assignor to Etablissement Liotte Representations Etrangeres, Vaduz, Liechtenstein

Filed Mar. 25, 1980, Ser. No. 133,921

Claims priority, application Switzerland, Mar. 29, 1979, 2896/79

Int. Cl.³ A01K *89/00*

U.S. Cl. 242—84.3 **2 Claims**



1. A fishing reel comprising a rotatable line drum and actuating means for rewinding the fishing line onto said drum, said actuating means comprising an actuating pulley on which a flexible cable is wound, said flexible cable being adapted to allow manually pulling the same to rotate said pulley, a return device coupled to said pulley for rotating the same back into a rest position subsequently to said pulling of said cable, and a unidirectional clutch device adapted to temporarily couple said actuating pulley to said line drum for rewinding the cable, said clutch device further comprising a radially extending cam member secured to said actuating pulley, a hollow member secured to said line drum having a cylindrical inner surface coaxially surrounding said cam member, at least two rollers freely placed on the peripheric surface of said cam member and roller guiding means for maintaining said rollers in parallel relationship with the axis of said line drum and in substantially constant spacing from each other, the shape and the dimensions of said cam member and the respective diameter of said cylindrical surface of said hollow member and of said rollers being adapted to cause the rollers to take up a wedging position for coupling said actuating pulley to said line drum when the cam member is rotated in a first direction, and to cause the rollers to move into an inoperative position, allowing free rotation of said line drum, when the cam member is rotated in the second, i.e. opposite direction, said clutch device further comprising a cylindrical spring member arranged in the space between said rollers and said cylindrical inner surface of said hollow member, so as to contact said hollow member only in the coupled state of the clutch device, said cylindrical spring member having a supporting member adapted to maintain the same in coaxial relationship with respect to the line drum and to prevent rotation of said cylindrical spring member except in the direction in which the coupling occurs.

4,346,858

EXTERNAL RELEASE FOR REDUCED TENSION MECHANISM

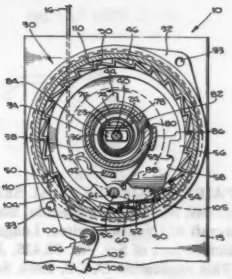
William M. Hollowell, Pacific Palisades, and Avraham Ziv, Sepulveda, both of Calif., assignors to American Safety Equipment Corporation, San Fernando, Calif.

Filed Jun. 30, 1980, Ser. No. 164,843

Int. Cl.³ A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107 **6 Claims**

1. In a dual tension safety belt retractor including a frame having a frame side wall, a shaft rotatably mounted on the frame, a belt storage reel connected to the shaft, said shaft having an end protruding through the frame side wall, a retraction mechanism mounted to apply a power rewind bias and low tension rewind bias to said reel via said shaft, said retraction mechanism including a housing having an inner annular surface defining inwardly facing teeth, a pawl associated with said shaft and engageable with said teeth to block out said power rewind bias wherein the improvement comprises:



means for selective annular rotation of said housing inner annular surface relative said housing whereby said power rewind bias may be applied to said shaft when said pawl is engaged with said teeth.

4,346,859

TAPE RECORDER

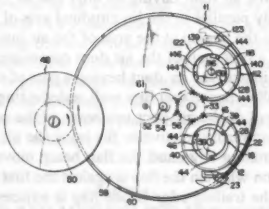
Akira Osanai, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1980, Ser. No. 142,243

Claims priority, application Japan, May 2, 1979, 54-59087[U]; May 2, 1979, 54-59088[U]

Int. Cl.³ G03B *1/04;* G11B *15/32*

U.S. Cl. 242—201 **5 Claims**



3. In a tape recorder which comprises a reel mechanism capable of transmitting a drive force from a drive disk to a driven disk through a one-way clutch provided with vortically shaped notches and balls loosely slidable through the notches, the reel mechanism including a reel rest and a reel shaft,

the improvement wherein:

the drive disk comprises a reel gear;

the balls of the one-way clutch are made of magnetically attractable material;

a magnetic member is provided for magnetically attracting the balls of the one-way clutch so that the balls are always pressed against the reel gear;

the magnetic member comprising a magnetic ring which is fitted to the reel rest rotatable with the reel shaft of the reel mechanism, the magnetic ring having on the surface thereof S and N poles which are alternately provided in the circumferential direction of the magnetic ring;

a magnetism-sensitive element is provided and is set closely adjacent to the magnetic ring and which generates pulses at a fixed period when detecting variations in the magnetic

force of the magnetic ring when the magnetic ring rotates with the reel shaft of the reel mechanism; and

a tape counter is coupled to count the pulses generated by the magnetism-sensitive element.

4,346,860

VANE FAIRING FOR INERTIAL SEPARATOR

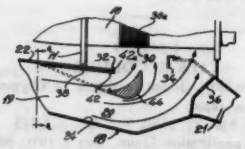
Donald J. Tedstone, St. Lambert, Canada, assignor to Pratt & Whitney Aircraft of Canada Limited, Longueuil, Canada

Continuation-in-part of Ser. No. 58,425, Jul. 18, 1979, abandoned. This application Dec. 5, 1980, Ser. No. 213,453

Claims priority, application Canada,

Int. Cl.³ B64D *33/02;* F02G *3/00*

U.S. Cl. 244—53 B 6 Claims



1. An air duct assembly for a gas turbine engine, wherein the engine has a longitudinal axis and an air intake open in a lateral direction, the air duct having an inlet and an outlet extending substantially parallel to the longitudinal axis of the engine and adjacent to the engine in the area of the air intake, an opening defined in a first wall of the air duct communicating with the engine air intake, the air duct having a pair of side walls and a second wall opposite said first wall, a deflecting flap hinged to the first wall of the air duct upstream of the opening and extending rearwardly relative to the inlet, the air deflecting flap having a trailing edge and the flap being movable between a first position wherein the flap is against the first wall of said air duct and the trailing edge of the flap is adjacent the opening, and a second position wherein the flap extends over a part of the cross-section of said air duct with a trailing edge being substantially midway between the first and second walls of the air duct thereby reducing the cross-section of the air passage, a fairing attached to and extending between the side walls of the air duct, the fairing having a leading edge and a trailing edge with the leading edge being located immediately downstream of the trailing edge of the deflecting flap when the deflecting flap is in its second position, the fairing having an airfoil shape with a high pressure concave surface and a low pressure convex surface extending between the leading edge of the trailing edge of the fairing and shaped such that the leading edge portion of the fairing is in the direction of the longitudinal axis of the air duct while the trailing edge portion of the fairing is in the direction of the air intake of the engine, the leading portion and the trailing portion of the fairing having flat surfaces merging with the convex surface thereof such that the angle defined by the flat surfaces of the leading and trailing portions of the fairing is an acute angle, whereby the fairing will divert air into the intake whether the deflecting flap is in the first position or the second position.

4,346,861

APPARATUS FOR HANGING A PROPULSION UNIT ON AN AIRCRAFT CELL, TOOLING AND PROCESS FOR USING SAME

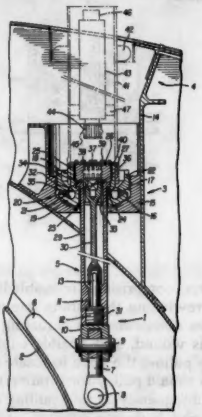
Paul J. Legrand, Vaux le Penil; Michel L. Dubeau, Dammarie les Lys, and Guy R. Pachomoff, Corbeil-Essonnes, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.", Paris, France

Filed Apr. 7, 1980, Ser. No. 137,916

Claims priority, application France, Apr. 9, 1979, 79 09396

Int. Cl.³ B64D *27/00, 29/00*

U.S. Cl. 244—54 8 Claims



1. Apparatus for hanging an engine propulsion unit on an aircraft cell, enabling setting of an engine attachment through a small recess provided in the cell, consisting of only three assemblies: first and second assemblies permanently respectively fixed to the engine and cell, and a third liaison assembly comprising two at least partially cylindrical and coaxial parts connecting only said first and second assemblies, wherein said second assembly forms an articulation and said articulation of the second assembly includes an axial passage enabling at least partial introduction of said liaison assembly through said recess of said cell, whereby said engine is both suspended and centered by said third assembly.

8. A process for hanging an engine propulsion unit on an aircraft cell through a small recess in said cell, by means of first and second assemblies respectively permanently fixed to the engine and cell, and a third liaison assembly connecting said first and second assemblies, said second assembly having an axial passage therein, wherein said method comprises:

positioning said engine vertically beneath said cell with said first assembly being vertically aligned;

engaging a guide tube tool passing through said recess of said cell to a first element of said second assembly to rotationally lock said guide tube; utilizing a first spanner tool to introduce a first part of said liaison assembly through said guide tube and said axial passage, and to lock said first part of said liaison assembly between said first element of said second assembly and a shaft of said first assembly;

tightening said first part of said liaison assembly on said shaft of said first assembly whereby said engine is raised toward said cell;

utilizing a second spanner tool to introduce a second part of said liaison assembly through said guide tube and said axial passage, and to position one end of said second part of said liaison assembly over a rotational blocking portion of said shaft of said first assembly;

utilizing said second spanner tool to introduce a locking part of said liaison assembly through said guide tube and lock-

ing said locking part to said first element of said second assembly with slight overtightening therebetween;

withdrawing said second spanner tool and said guide tube tool; and

utilizing an elastic element to block rotational movement between said locking part and said first part of said second assembly.

4,346,862

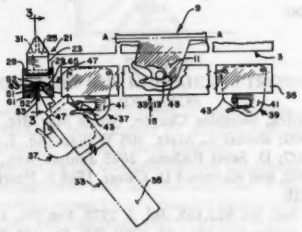
DUAL LOAD POINT EXTERNAL LOAD SUSPENSION IMPLEMENT

Ernest H. Richburg, Hamden, Conn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 2, 1981, Ser. No. 230,768

Int. Cl.³ B64C *1/08*

U.S. Cl. 244—137 R **4 Claims**



1. In an aircraft, such as a helicopter or the like, having a support structure and a single point external loads attachment hook means, said aircraft hook means being pivotal about an axis parallel to the longitudinal axis of said aircraft and being selectively operable between a first position in which a load is securely held thereby and a second position in which said load may be selectively released, wherein the improvement comprises: a dual point suspension implement adapted to be secured to said aircraft and to support an external load by means of two load suspension points spaced longitudinally from one another on said dual point suspension implement, said suspension implement comprising a carriage support secured to said aircraft support structure forwardly of said aircraft hook means, said carriage support extending laterally with respect to said aircraft and comprising a curved track member having its radius of curvature substantially coincident with said pivot axis of said aircraft hook means, said implement further comprising a carriage, the latter having a plurality of rollers, said rollers being engageable with said curved track whereby said carriage is free to move along said curved track in arcuate fashion with respect to said pivotal axis of said aircraft hook means whereby said implement is free to swing relative to said aircraft relative to said pivot axis, and a main body extending longitudinally of the aircraft below said support structure, means carried by said main body for engagement with said aircraft hook means, said main body further having said two external loads suspension points spaced from one another therealong in longitudinal direction of said aircraft, said means for engaging said aircraft hook means being intermediate said two external loads suspension points, said main body further having means at the front of said main body for engagement with said carriage, said carriage engagement means upon selective actuation of said aircraft hook means from its first to its second position permitting said main body to swing downwardly from a load carrying position in which said main body is substantially parallel to the longitudinal axis of said aircraft to a release position in which said main body angles downwardly relative to said aircraft longitudinal axis and pivots about said carriage engagement means and in which said carriage engagement means separates from said carriage allowing said main body and any external load carried thereby to fall free of said aircraft.

4,346,863

ATTACHMENT DEVICE FOR A BRAKE HOSE

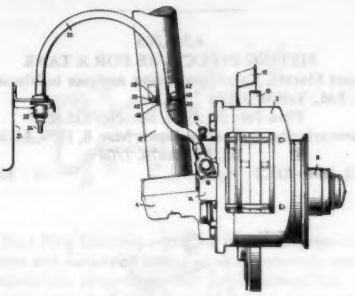
Günther Zeiträger, Hattersheim; Gerhard Krause, Flörsheim, and Herbert Guthmann, Bischofsheim, all of Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 17, 1980, Ser. No. 197,894

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1980, 3004421

Int. Cl.³ A62C *23/04*

U.S. Cl. 248—75 **5 Claims**



1. In a vehicle wheel brake installation wherein the wheel brake assembly is suspended with the wheel to be braked at a resilient strut to permit movement thereof relative to the vehicle body which is controlled and limited and wherein a flexible brake hose has one end attached to the vehicle body and the other end secured to the wheel brake assembly, the improvement for securing said brake hose in said installation comprising:

a device attaching an intermediate portion of the brake hose to a portion of the resilient strut in a motionally responsive manner, said device including a sleeve connected to the brake hose so as to be axially and rotationally fixed with respect thereto to a connection point thereon located at a distance along the brake hose from the securing point of said other end of the brake hose to the wheel brake assembly which is greater than the distance of said connection point from said securing point, a holding part firmly secured to the resilient strut, and clamping means fixing said sleeve to said holding part.

4,346,864

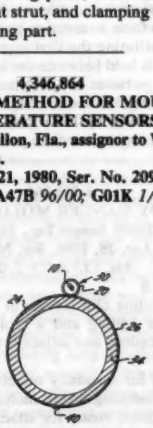
MEANS AND METHOD FOR MOUNTING TEMPERATURE SENSORS

Murray F. Feller, Dunnellon, Fla., assignor to Wilgood Corporation, Jacksonville, Fla.

Filed Nov. 21, 1980, Ser. No. 209,157

Int. Cl.³ A47B *96/00*; G01K *1/14*

U.S. Cl. 248—231 **11 Claims**



1. Means for mounting a temperature sensor on a pipe, comprising a sheet-metal strap having a medial portion and first and second integral portions extending oppositely from said

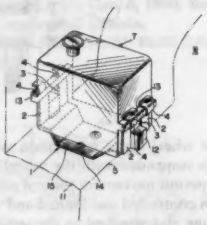
medial portion, said first integral portion being elongated to constitute a first strip, said medial portion being wider than said strip and having an aperture therein through which said strip can be threaded so that the strip forms a loop for encircling the temperature sensor and said first and second integral portions of the strap extend oppositely from said medial portion for encircling a pipe whose temperature is to be sensed, said integral portions having end portions remote from said medial portion which are adapted to be drawn toward each other and secured together with said strap tensioned about the temperature sensor and about the pipe in "FIG.-8" configuration.

4,346,865

FITTING STRUCTURE FOR A TANK

Masanori Murata, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1980, Ser. No. 125,459
Claims priority, application Japan, Mar. 8, 1979, 54-28625[U]
Int. Cl.³ A47K *1/08*
U.S. Cl. 248—311.2 **13 Claims**



1. A structure for fitting a tank in an engine compartment of a vehicle body, comprising a fitting member for partitioning the engine compartment, and a bracket fixed on the fitting member, the bracket having a first engaging portion for positioning the tank in its longitudinal direction, a second engaging portion for positioning the tank in its lateral direction and a third engaging portion for positioning the tank in its vertical direction, the first, second and third engaging portions of the bracket being so designed as to engage with the opposite side walls of the tank thereby to hold detachably the lower portion of the tank relative to the vehicle body when the tank is set in position onto the bracket and wherein both end portions of the bracket are bent to form an erecting portion, respectively, such bent portions constituting the first engaging portion in such a way that the tank is held between the bent end portions of the bracket, the bent portions of the bracket being further bent outwardly in a channel shape to constitute the third engaging portion with which a projection fixed on each opposite side wall of the tank at its intermediate portion is to be engaged.

4,346,866

HANDY HANGER MOLDING CLIP

John W. O'Hara, 10466 Sunset Ter., Des Moines, Iowa 50322

Filed Apr. 28, 1980, Ser. No. 144,575
Int. Cl.³ A47F *5/00*
U.S. Cl. 248—316 B **3 Claims**

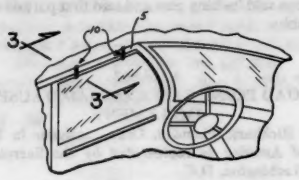
1. A hanger molding clip for use in a vehicle having a deformable headliner ceiling and a molding strip around the perimeter of said ceiling and adjacent thereto; said clip comprising:

fastening means for manually selectively fastening objects thereto, said fastening means including an alligator clip;

a fastener component means for attachment to said fastening means;

a resilient mounting component means for being deformably placed between said headliner ceiling and said molding strip for securement to said vehicle;

hinge means for hingably connecting said fastener component means to said mounting component means, said hinge means comprising a plurality of parallel score lines which partially penetrate the thickness of said resilient mounting component means; and



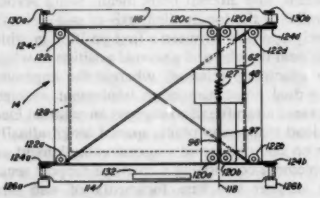
wherein said fastener component means, mounting component means and hinge means is of integral, one piece construction.

4,346,867

TRANSPORT MECHANISM FOR ULTRASONIC SCANNER

Donald E. Dick, Sunshine Canyon, Salina Star Rte., Boulder, Colo. 80302; Robert L. Metz, 408 William No. 5, Superior, Colo. 80027; D. Scott RoJohn, 2645 Juniper Ave., Boulder, Colo. 80302, and Raymond D. Elliott, 1569 S. Pearl, Denver, Colo. 80210

Division of Ser. No. 922,185, Jul. 5, 1978, Pat. No. 4,233,988.
This application May 19, 1980, Ser. No. 151,338
Int. Cl.³ F16M *13/00*; F16H *27/02, 55/52*
U.S. Cl. 248—424 **5 Claims**



1. A transport mechanism comprising:

a pair of rails mounted so that they are substantially parallel to each other;

a bridge having two ends, said bridge being mounted on said rails for movement over a predetermined portion of said rails, said bridge having a longitudinal axis, said bridge being mounted on said rails so that its longitudinal axis is substantially perpendicular to the rails;

a carriage mounted on the bridge for movement substantially parallel to the longitudinal axis of the bridge;

a pair of rail pulleys mounted on each rail outside of said predetermined portions;

two pairs of bridge pulleys, a pair of bridge pulleys being mounted substantially at each end of the bridge;

a pair of flexible cables, each cable having two ends;

means for fastening each of the ends of each cable to said carriage, with at least one end of each cable being attached to said carriage by tensioning means;

said cables being positioned on and guided to and from said pulleys so that when the rail pulleys on the same one of the rails rotate in the same direction at the same rate, the bridge moves parallel to the rails, when said rail pulleys on the same one of said rails rotate in the opposite direction at the same rate, the carriage moves on the bridge; and

means for separately and simultaneously applying torque to at least two pulleys around each of which passes a different one of the flexible cables to move the carriage and the

bridge so that when the speed of said cables is the same, one or the other of the bridge and carriage moves, and when the speed of the cables is different, both of the bridge and carriage move.

4,346,868

DISPLAY DEVICE

Henry Lindner, Wood Dale, Ill., assignor to Beatrice Foods Co., Div. of Elgin Molded Plastics, Elgin, Ill.

Filed May 19, 1980, Ser. No. 151,374
Int. Cl.³ A47G 1/16
U.S. Cl. 248—475 R 11 Claims

1. A display device comprising in combination:

(A) a backing plate means of integral one-piece molded construction having a back face and

(B) a bracket means which is slidably engagable into a locking engagement with said backing plate means,

(C) mounting means for said bracket means which is integral with said backing plate, said mounting means comprising:

(1) a pair of retaining guides, each one of said pair being in spaced, parallel relationship to the other thereof, each one thereof having a vertical extension which upstands from said back face of said backing plate and a gib which horizontally extends from the top of said vertical extensions horizontally relative to said back face, the two gibs being in opposed spaced generally parallel relationship one to the other, each gib and its associated said extension defining a channel,

(2) raised bearing pad means positioned integrally on said back face, in adjacent relationship to said extensions and in spaced adjacent parallel relationship to said gibs, the combination of said pad means and said retaining guides defining a slot within which said bracket means, can slidably move, and further defining a cavity in the region of said pad means and said back face,

(3) a ramp means integrally associated with said back plate and disposed across a pair of adjacent end regions of said retaining guides with the ramp height increasing with increasing distance away from said end regions, the height of said ramp being about equal to the height of said bearing pads relative to said back face,

(4) a raised region integrally upstanding from said backing plate located adjacent said ramp means and forwardly from said end regions, said raised region defining perimetrically a pocket which is approximately in said back face, said raised region having a height about equal to the height of said bearing pads relative to said back face,

(5) a stop plate means upstanding from said back face and extending across a portion of said back face adjacently to said raised region,

(D) said bracket means having a tongue means defined therein adjacent one end thereof projecting from one side surface thereof which tongue terminates in an abutting ledge means on the side thereof remote from said one end and which tongue has an inclined surface means thereon which increases in height relative to said one side surface with increasing distances from said one end up to said ledge,

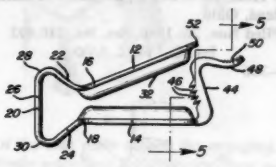
(E) the interrelationship between said mounting means and said bracket means being such that, when said bracket is slidably engaged with said retaining guides and is slid relative to said backing plate means until said tongue has moved over said ramp, said tongue seats in said pocket with said one end being in adjacent relationship to said stop plate, thereby locking said bracket means in engagement with said backing plate means.

4,346,869

TUBE CLAMP

Robert L. MacNeill, 54 High St., Newburyport, Mass. 01950

Filed Mar. 12, 1981, Ser. No. 242,848
Int. Cl.³ F16K 7/04
U.S. Cl. 251—10 2 Claims



1. A fluid flow blocking pump for use in conjunction with blood lines and associated tubing sections presently used during hemodialysis procedures, said clamp comprising a one-piece construction including first and second elongated, side-by-side and generally parallel longitudinally straight jaw members including first and second pairs of corresponding ends, an open loop member having spaced opposite ends formed integrally with one pair of said corresponding ends, said jaw members and loop member being constructed of shape retentive and slightly resilient plastic material with said loop interconnecting said one pair of jaw member ends for relative angular swinging of said jaw members between closed juxtaposed substantially parallel positions and open positions with said jaw members swung at least slightly away from each other and divergent toward the second pair of corresponding ends thereof, said jaw members, when in said closed positions, including closely juxtaposed parallel sides, one of said juxtaposed sides including a lengthwise extending elongated raised rib thereon of smooth substantially sine wave shape in cross section, the other of said juxtaposed sides defining a lengthwise extending elongated channel of substantially sine wave shape in cross section and with the radius of curvature of the apex portion of the first mentioned sine wave shape being slightly less than the radius of curvature of the second mentioned sine wave shape, one of the other pair of corresponding ends of said jaw members including a transverse terminal end lip and the other end of said other pair of corresponding ends including a generally right angulated elongated tongue formed integrally therewith, said tongue extending outwardly of said other end in the direction in which the other jaw member is swingable toward the open position and including transversely extending longitudinally spaced ratchet teeth formed on the side thereof facing said loop member, said ratchet teeth facing away from the free end of said tongue and engageable by said lip to releasably prevent relative swinging movement of said jaw members toward said open positions, the juncture of said tongue with said other end of said other pair of corresponding ends being somewhat flexive and resilient, whereby said tongue may be swung, slightly away from said loop, to disengage said teeth from said lip, said tongue, in non-flexed condition, being inclined slightly inwardly toward the connecting loop member end of said jaw members, said loop member, when in a relaxed state, including a pair of generally straight arm portions convergent toward one pair of ends thereof comprising said opposite ends of said loop member, and an integral elongated and generally longitudinally straight connecting bight member extending between and connecting the other pair of ends of said arm portions, said jaw members being generally strap-like in configuration and said rib being formed on the side of one of said strap-like

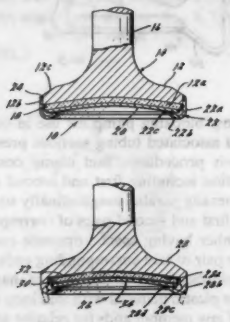
jaws opposing the other jaw, said other jaw member including a pair of laterally and longitudinally extending ribs formed thereon on the side opposing said one jaw member and said channel is defined between said pair of ribs.

4,346,870

THERMAL BARRIER FOR POPPET VALVE

Richard Chute, Birmingham; Jay M. Larson, Marshall; Theodore N. Tunnecliffe, Battle Creek, and Roger P. Worthen, Farmington Hills, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Nov. 26, 1980, Ser. No. 210,692
Int. Cl.³ F01L *3/00*
U.S. Cl. 251—356 **13 Claims**



1. A thermal barrier for a poppet valve having a mushroom head defining a circular face portion normally exposed to combusting gases in a combustion chamber of an expansible chamber engine, the thermal barrier comprising:

an insulator substantially covering the face portion; and

a flange member including a skirt portion fixed at one end of the valve head and bent over at the other end to define a flange portion clamping said insulator against the face portion, said skirt portion having a wall circumscribing the insulator and extending at said other end beyond the general plane of the outer periphery of the insulator and a flange portion bent over the outer periphery of the insulator and contacting only the outer end of means covering said insulator, said flange portion making an inside angle of less than ninety degrees with the wall of said skirt portion.

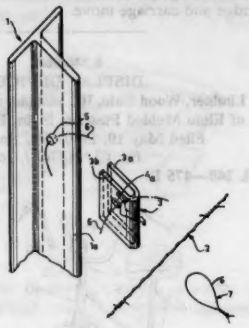
4,346,871

STRUCTURE FOR AFFIXING METALLIC WIRE TO SUPPORT POSTS

Francois M. Mauduit, 12, rue de la Vicomte, 76490 Caudebec-en-Caux, France

Filed May 3, 1979, Ser. No. 35,630
Claims priority, application France, May 10, 1978, 78 13879
Int. Cl.³ A01K *3/00*
U.S. Cl. 256—10 **6 Claims**

1. A device for fixing metallic wires on support posts, externally to same, characterized in that between each post and each wire there is inserted a piece of non-oxidizable material which is not electrically conductive and which physically separates the wires from the posts, with the further provisions that said post is provided with an opening, said piece of non-oxidizable material is provided with a complemental opening, and said post and piece are tied together with a flexible fixation tying member which passes through said complemental openings and around said metallic wire so as to hold the latter in



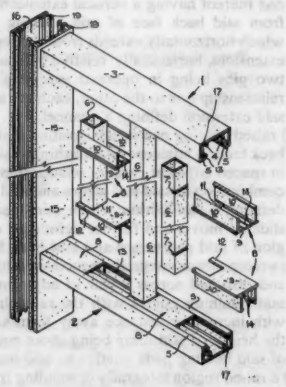
place against said piece of non-oxidizable material and out of direct contact with the said post.

4,346,872

BALUSTRADE CONSTRUCTION

Andrew G. Tornya, 207 Edgecliff Rd., Woollahra, N.S.W., 2025, Australia

Filed Aug. 16, 1979, Ser. No. 67,134
Claims priority, application Australia, Jul. 19, 1979, 49084/79
Int. Cl.³ E04H *17/14*
U.S. Cl. 256—65 **11 Claims**



1. A balustrade unit comprising a pair of spaced-apart channel-section members, the mouths of which are directed towards each other, the free edges of each said channel-section member being bent so as to form a pair of longitudinally-extending flanges, and a pair of longitudinally-extending, spaced-apart engaging elements provided on and upstanding from the base portion of each said channel-section member; a plurality of balusters disposable between said channel-section members, each baluster having, adjacent each end thereof, a transverse slot, the two slots in each baluster being in the same side thereof and parallel, and the ends of said balusters being receivable between said engaging elements when said balusters are in position between said channel-section members; and a plurality of spacers each one of which extends between adjacent balusters of said balustrade unit, each said spacer having a table portion the side edges of which are receivable in rebates in said longitudinally-extending flanges, and a pair of valances disposed normal to said table portion and adapted to irremovably engage with said engaging elements when said spacer is

disposed between adjacent balusters, each said table portion including a bight the base of which is receivable in a said transverse slot and the limbs of which extend on either side of the baluster to enclose the space between a baluster and a longitudinally-extending flange.

4,346,873

LEAD SCREW PORTABLE TORCH DRIVE

Franklin W. Domres, 4117 Crescent Beach Rd., Manistee, Mich. 49660

Filed Feb. 18, 1981, Ser. No. 235,524
Int. Cl.³ B23K 7/10
U.S. Cl. 266—71 13 Claims

1. A portable torch support and guide comprising:
an elongated support base for resting on metallic stock to be cut;
retention magnets attached to said support base and oriented to engage the metallic stock for retaining said support base to said stock;
an upstanding carriage track along said support base;
a torch mounting carriage movable along said carriage track and having means for mounting a torch thereon;
a feed screw lengthwise along said elongated support base, having a first end and an opposite second end, a screw actuator at said first end of said feed screw,
a first bearing support on said support base, at said first end of said feed screw, said feed screw being tiltable at said first bearing support through a small acute angle;
a second bearing support adjacent the opposite end of said support base from said first bearing support, shiftable into and out of support engagement with said second end of said feed screw;
and said carriage having a threaded member in engagement with said feed screw for driving said carriage therealong, said feed screw being releasable from said threaded member with tilting of said feed screw to allow rapid return of said carriage to its starting position.

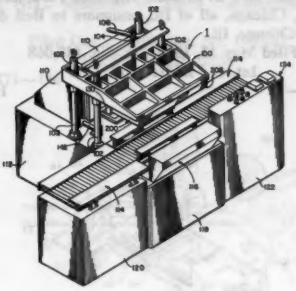
4,346,874

VACUUM ACTUATED HOLDING APPARATUS FOR A PLASTIC WELDING MACHINE

Joseph V. Kurpiewski, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Filed May 27, 1980, Ser. No. 153,175
Int. Cl.³ B25B 11/00
U.S. Cl. 269—21 20 Claims

1. A holding means for use with a plastic welding machine having a vacuum supply means, the holding means comprising:
(a) a mounting plate, having a face adapted to receive an article to be retained to the holding means;
(b) actuation means comprising at least one port extending through the face of the mounting plate;
(c) a vacuum actuated piston means operatively associated with the actuation means and the vacuum supply means;
side plate means, movably connected to selected edges of the mounting plate and operatively associated with the vacuum actuated piston means; and
(e) means for engaging selected portions of the article to be retained within the holding means responsive to movement of the side plate means, the engaging means being operatively associated with the side plate means.

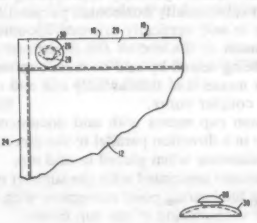


4,346,875

PASTRY CLOTH HAVING SUCTION CUPS REMOVABLY ASSOCIATED THEREWITH

Patricia J. Spencer, 805 Valley View Rd., Ft. Collins, Colo. 80524, and Carrie P. DeRoeck, 8952 W. 81st Ln., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 166,757, Jul. 7, 1980, abandoned. This application Aug. 21, 1981, Ser. No. 295,221
Int. Cl.³ A47J 43/00; B32B 3/12, 3/16
U.S. Cl. 269—302.1 8 Claims



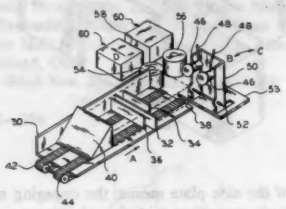
1. A pastry cloth assembly comprising:
a sheet of flexible cloth, of a material suitable for the rolling-out thereon of dough in the preparation of a food, having a peripheral margin;
a plurality of first fastener parts spaced successively around said margin;
and a plurality of suction cups each securingly engageable with a flat surface and each having a second fastener part individually connectable removably with a respective one of said first fastener parts to dispose all of said suction cups on a single major surface of said cloth, engagement of said cups with said surface permitting stretching of said cloth to enable rolling of said dough against said surface through said cloth.

4,346,876

VACUUM DOCUMENT FEEDER

Kenneth L. Guenther, Park Ridge; Jerry J. Kosner, Jr., Oakbrook Terrace; Rolf B. Erikson, Highland Park, and Edward H. Zemke, Chicago, all of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed May 12, 1980, Ser. No. 148,068
Int. Cl.³ B65H *3/08, 1/02*
U.S. Cl. 271—11 **10 Claims**



1. A vacuum document feeder system comprising:
drive means to provide power to a four bar mechanism having at least one bearing point, said drive means causing said bearing point to cyclically rotate over a somewhat crescent shaped coupler curve,
support means connected to said bearing point,
at least one document seizing vacuum cup means pivotally mounted on the support means whereby said vacuum cup means cyclically follows said somewhat crescent shaped coupler curve,
means for delivering vertically oriented documents from a horizontal stack of documents to a document pick-up location at an end of the horizontal stack,
said vacuum cup means pivoting from a substantially vertical orientation to an angle relative to said vertical orientation to accomodate documents leaning at said angle relative to said vertical orientation,
document transport means for moving documents in a direction away from said vacuum cup means, said document transport means having a nip for receiving documents seized and removed from said horizontal stack by said vacuum cup means,
said support means cyclically approaching and leaving said stack in substantially horizontal, perpendicular directions relative to said vertically oriented documents,
the document at the end of the horizontal stack of documents being seized by said vacuum cup means when said support means is at substantially one end of said crescent shaped coupler curve,
said vacuum cup means with said documents approaching said nip in a direction parallel to the direction of travel of said documents when placed in said nip,
and cam means associated with the support means for coordinating the bearing point movement with both the pivoting and vacuumizing of the cup means.

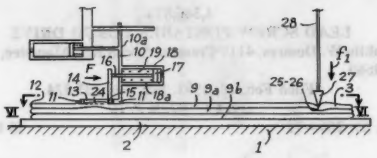
4,346,877

DEVICE FOR HANDLING SHEET-LIKE PIECES

Joël Doyen, Ste Savine, and Jean-Pierre Raisin, Troyes, both of France, assignors to Agence Nationale de Valorisation de la Recherche, Neuilly, France

Filed May 9, 1980, Ser. No. 148,507
Claims priority, application France, May 17, 1979, 79 12639
Int. Cl.³ B65H *3/26*
U.S. Cl. 271—19 **10 Claims**

1. In a device for handling a piece of supple, elastically deformable sheet such as a piece of material comprising a frame and a sheet support mounted thereon,
at least one gripping means mounted above the support for gripping the sheet, the gripping means comprising a gripper body and at least two gripper elements comprising first and second gripper elements mounted to move with respect to each other on the gripper body, displacing means associated with the gripping means for displacing the gripper elements with respect to one another, means for mounting the gripper body on the frame movable between a first position for which at least one of the gripper elements contacts the sheets and at least one second position for which the gripper elements are spaced apart



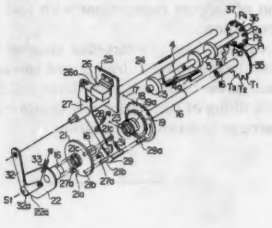
from the support, means for displacing the gripper body between the first and second positions,
the first gripper element having a swelling surface for at least partially enveloping a portion of the sheet when the gripper element is in its first position to cause the sheet to swell in the area enveloped by the first gripper element, and means for moving the second gripper element toward a portion of the first gripper element across the swell of the sheet to pinch the sheet between the two gripper elements.

4,346,878

SHEET FEEDING APPARATUS

Masahiro Aizawa, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 24, 1980, Ser. No. 133,093
Claims priority, application Japan, Apr. 9, 1979, 54-42749; Apr. 9, 1979, 54-42750
Int. Cl.³ B65H *3/06, 1/14*
U.S. Cl. 271—118 **9 Claims**



1. A sheet feeding apparatus comprising:
a cassette for holding a plurality of sheets and including a bottom plate movable upwardly to bring said sheets into a sheet feeding position and movable downwardly to withdraw said sheets from said position;
means including a roller located above said cassette at said sheet feeding position for feeding sheets individually from said cassette;
a pushing member adapted to engage the lower surface of said bottom plate for moving said bottom plate upwardly and downwardly; and
drive means connected to said pushing member for intermittently moving said pushing member in a first direction to move said bottom plate upwardly to bring said sheets into engagement with said roller and a second direction to allow said bottom plate to move downwardly to withdraw said sheets from said roller; said drive means being connected intermittently to said push member by a clutch comprising a rotating ratchet wheel, a pawl lever adapted

to engage said ratchet wheel and connected integrally with a cam, means connected to said pawl lever for moving it into engagement with said ratchet wheel to cause rotation of said cam when desired to move said pusher member, and means including a cam follower engaging said cam for moving said pusher member upwardly and then downwardly upon rotation of said cam.

4,346,879

SHEET SEPARATING DEVICE FOR OFFICE MACHINES

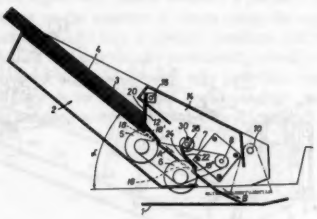
Kurt Ruenzi, Kuesnachterstrasse 59, CH-8126 Zumikon, Switzerland

Filed Aug. 27, 1980, Ser. No. 181,676

Claims priority, application Switzerland, Sep. 7, 1979, 8076/79

Int. Cl.³ B65H *3/52*

U.S. Cl. 271—121 2 Claims



1. A device for separating sheets of paper from a stack and for feeding the sheets to an office machine, comprising bottom means (3) for supporting the sheet stack (4), said bottom having longitudinally aligned slots (18) therein, at least a portion of said bottom means being inclined to the horizontal, first separating means (5, 12) operatively arranged for cooperation with said bottom means, and second separating means (6, 22) also operatively arranged for cooperation with said bottom means downstream of said first separating means (5, 12) as viewed in the direction of sheet advance, wherein each of said first and second separating means comprises at least one first and second plate-like separating member (12, 22) provided with a friction facing (20, 24) and at least one first and second separating roller (5, 6) also provided with a friction facing, said first and second separating rollers (5, 6) reaching upwardly through the respective slot (18) in the bottom means (3), whereby a sheet is supported by said bottom means even downstream of said first and second separating rollers (5, 6), said first and second separating members (12, 22) being arranged above the respective separating roller, wherein each of the plate-like separating members (12, 22) comprises two fingers (19) forming further slots (18', 18'') in register with said slots (18) in the bottom means (3), whereby said separating roller (5, 6) is reaching between the fingers (19) of the respective separating member (12, 22) to such an extent that a sheet of paper transported through the gap between the separating member and the separating roller assumes a somewhat flat curvature, and wherein the separating member (12) of the first separating means is rigidly secured and held in position, said first separating member (12) having an angularly extending upper section, whereby a portion of the stack rests against said upper section, said first separating member further comprising a lower section forming said fingers (19), said device further comprising tilting means for the downstream, second separating member (22), whereby said downstream, second separating member (22) is tiltable through a limited angle.

4,346,880

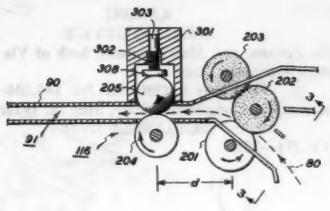
APPARATUS FOR INVERTING SUBSTRATES

George J. Roller, Rochester, and Richard P. Schell, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 2, 1980, Ser. No. 193,242

Int. Cl.³ B65H *29/00*

U.S. Cl. 271—186 10 Claims



1. A substrate inverter, comprising:

(a) inversion channel means;

(b) input drive means for driving a substrate into said channel means, said input drive means including a smooth roll and an elastomeric roll that forms an input nip, said smooth roll having a narrower width than said elastomeric roll;

(c) output drive means for driving a substrate out of said channel means, said output drive means including said elastomeric roll; and

(d) return nip means located within said channel means and downstream of said input drive means and arranged for applying a continuous force to the substrate in a direction opposite to the initial incoming sheet direction while and at the same time the substrate is being influenced by said input means, whereby as the last portion of the substrate leaves said input means the force of said nip means will drive the substrate into said output means for movement out of said channel means.

4,346,881

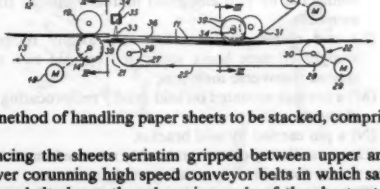
METHOD OF AND MEANS FOR HANDLING PAPER SHEETS TO BE STACKED

Kenneth G. Frye, Lee, Mass., assignor to Lenox Machine Company, Inc., Lenox, Mass.

Continuation of Ser. No. 29,397, Apr. 12, 1979, abandoned. This application Feb. 6, 1981, Ser. No. 232,170

Int. Cl.³ B65H *9/14, 29/12*

U.S. Cl. 271—208 17 Claims



1. A method of handling paper sheets to be stacked, comprising:

advancing the sheets seriatim gripped between upper and lower corunning high speed conveyor belts in which said lower belts leave the advancing ends of the sheets at a predetermined point while said upper high speed conveyor belts extend a substantial distance beyond said point into sheet controlling tunnel relation over a slower speed multi-belt conveyor;

propelling the sheets across a gap from said lower high speed conveyor belts toward and onto said slower speed conveyor;

and after each successive sheet has been fully received on

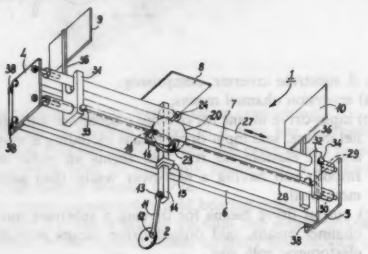
said slower speed conveyor stopping high speed advance of the sheet and effecting impermanent wave-like longitudinal jam preventing stiffening rib deflection of the sheet and causing the sheet to travel with the slower speed conveyor so as to receive from said high speed conveyor belts a succeeding sheet in superimposed overlapping relation for stacking purposes.

4,346,882

JOGGING DEVICE

Giorgio Pessina, and Aldo Perobelli, both of Via Arborina 2, Paderno-Dugnano, Italy

Filed May 5, 1980, Ser. No. 146,204
Claims priority, application Italy, May 18, 1979, 22808 A/79
Int. Cl.³ B65H *31/38*
U.S. Cl. 271—221 **8 Claims**



1. A jogger device for jogging signatures or sheets during the formation of stacks in bookbinding machines, said jogger device comprising:

(A) a source of rotary motion,

(B) a supporting structure,

(C) a central jogging vane,

(D) two side jogging vanes,

(E) displaceable elements supporting said central and side vanes from said supporting structure for jogging movement relative to said structure,

(F) means for converting the rotary motion of said source of rotary motion to reciprocating motion,

(G) one of said displaceable elements constituting an elongated straight element,

(H) means mounting said straight element for axial reciprocation,

(I) means securing the central vane to the straight element, and

(J) means adjustably connecting the side vanes to the displaceable elements for the same, characteristized in that:

(K) said supporting structure constitutes two side members connected by two elongated mutually spaced transverse members,

(L) said means for mounting said axially reciprocating straight element being supported by said two mutually spaced transverse members,

(M) a bracket mounted on said axially reciprocating straight element,

(N) a pin carried by said bracket,

(O) an oscillating element rotatably mounted on said support means for said reciprocating straight element,

(P) a pair of pins carried by said oscillating element at diametrically opposed points with respect to the axis of rotation of the oscillating element,

(Q) a radial slot in the oscillating element in which the bracket pin rides,

(R) two transverse rods mutually spaced apart and located between said side members,

(S) means mounting said rods for independent axial reciprocation,

(T) said rods being shorter than the distance between the side members,

(U) each of said rods having means thereon for engaging a different one of the pins supported by the oscillating element, and

(V) said displaceable elements which support the side vanes being adjustably connected to different ones of the rods,

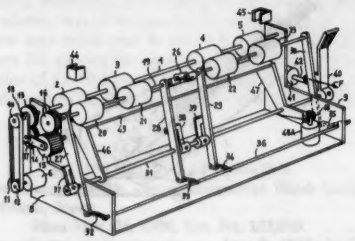
(W) whereby rotation of the source of rotary motion jogs the central vane in a direction transverse to the axially reciprocating members and jogs the side vanes in a direction transverse to the jogging direction of the central vane.

4,346,883

DOCUMENT POSITIONING AND FEEDING APPARATUS FOR HIGH SPEED PRINTERS

Marcello Speraggi, Milan, Italy, assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Aug. 28, 1980, Ser. No. 182,165
Claims priority, application Italy. Aug. 30, 1979, 25357 A/79
Int. Cl.³ B65H *5/02*
U.S. Cl. 271—274 **2 Claims**



1. In a document feeder apparatus for a printer comprising:

back feeding roller element;

fore feeding roller element;

support means for said roller elements, said support means aligning the axis of rotation of said fore feeding element with the axis of rotation of the back feeding elements, said support means maintaining said roller elements in resilient contact with one another, said support means allowing parts of said roller elements to assume a different distance therebetween while maintaining the axis of rotation of the parts parallel to each other; and

coupling means connecting said back feeding roller element to said fore feeding roller element, said coupling means being operable to provide equal and opposite rotation of said roller elements, said coupling means further being operable to substantially prevent relative rotary motion between said elements during the feeding of stock into the printer;

whereby one of said feeding elements is divided in at least two parts having parallel shafts, the shafts of said two parts being coupled by a universal joint which secures for the two parts identical acts of rotary motion, and said support means allowing the shafts of said two parts to be positioned at different distances from the shaft of the other of said feeding element.

4,346,884

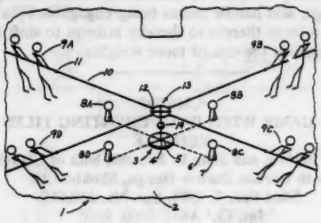
MULTI-TEAM TUG-OF-WAR GAME APPARATUS

Norwood R. Warehime, 704 W. 34th St., Baltimore, Md. 21211

Filed Sep. 26, 1980, Ser. No. 191,085
Int. Cl.³ A63B *21/28*
U.S. Cl. 273—1 GH **8 Claims**

1. Multi-team tug-of-war game apparatus comprising a playing surface, said playing surface including a game area, a plurality of tugging ropes, a central hub including a vertically

dependent position indicating pointer, means for attaching one end of each of said ropes to said central hub, a game apparatus positioning indicator means for indicating the starting position of said pointer over said game area, and for indicating the proper relative radial orientation of said ropes relative to said hub, a plurality of goals on said playing surface positioned about and spaced from said starting position, and a goal contac-



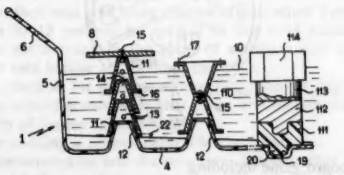
tor means on said pointer for contacting said goals to indicate the winner of a tug-of-war contest whereby a plurality of ropes equal in number to the number of teams using the apparatus may be attached to said hub at proper positions and relative radial orientation, said hub may be positioned centrally relative to said goal means, and team players may pull their respective ropes in an attempt to cause said goal contactor means to contact their assigned goal to win tug-of-war contest.

4,346,885

WATER-AND/OR SANDBOX CONSTRUCTION

Marcel Mathou, 12630 Gages, France

Filed Oct. 23, 1980, Ser. No. 200,056
Claims priority, application France, Nov. 7, 1979, 79 27501
Int. Cl.³ A63G *31/00*
U.S. Cl. 272—1 A **11 Claims**



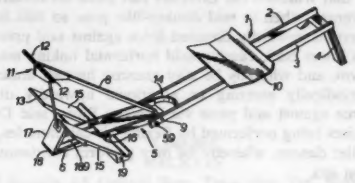
1. A box construction for water, sand or the like product, comprising an integrally molded body having a bottom and side-walls prolongated outwardly by inwardly inclined edge portions, said body defining an inner space for containing a product, a separate construction member, a separate support member for supporting said construction member within said inner space for said body, said bottom of said body being locally provided with shaped mounting portions integrally formed therewith, said separate support member having releasable engaging means for releasable nesting engagement with a said shaped mounting portion so as to support at a distance inwardly from said edge portions of said body said releasable construction member at a selected height above said bottom wall of said body whereby said construction member is accessible when said box is filled with a product.

4,346,886

VARIABLE RESISTANCE EXERCISING DEVICE

Alan W. Cox, Bray, and Paul N. Rainey, Kingston-upon-Thames, both of England, assignors to Black & Decker Inc., Newark, Del.

Filed Jun. 4, 1980, Ser. No. 156,509
Claims priority, application United Kingdom, Jun. 4, 1979, 7919375
Int. Cl.³ A63B *21/00*
U.S. Cl. 272—72 **16 Claims**



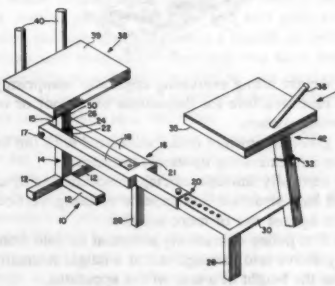
1. An exercising device comprising:
a housing in which is mounted a plurality of spaced apart rotatable surfaces;
a flexible, elongate member that passes into the housing, around the rotatable surfaces and out of the housing;
means for selectively and releasably locking at least one of the surfaces against rotation to enable a user of said exercising device to select in a repeatible manner different degrees of effort that must be exerted in using said device;
a framework,
an arm having one end pivotally secured to said framework, said arm having said housing mounted thereon, and adjacent the other end thereof; and
a take-up reel mounted in said housing and resiliently biased into a take-up action, the flexible elongate member being connected at one end to said framework and at the other end to said take-up reel.

4,346,887

DONKEY CALF EXERCISING MACHINE

Leonard Poole, c/o Williamson, Esq., P.O. Box 36015, Cincinnati, Ohio 45236

Filed Feb. 8, 1979, Ser. No. 10,236
Int. Cl.³ A63B *23/04*
U.S. Cl. 272—117 **4 Claims**



1. An exercising apparatus for developing an exerciser's calf muscles, said apparatus comprising:
(a) an upright front post means for supporting a substantially horizontal linking means;
(b) said horizontal linking means pivotally mounted on a horizontal member attached to said upright front post means and extending for a length of about an exerciser's

upper body, the extended end of said linking means having a leg means for safety and floor support when not in use;

(c) a force resistance means attached to the extended end of said linking means said force resistance means having a weight press member positioned in a spaced relation above the exerciser's lower back when he bends the trunk of his body forward and assumes a donkey-like pose;

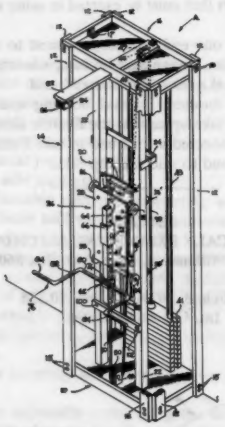
(d) a forearm support means associated with said front post means and positioned in a special relation away from and at a lower elevation than that of said weight press member so that whereon the exerciser can place his forearms for leverage when in said donkey-like pose so that he may exert an upwardly directed force against said press with his lower back causing said horizontal linking means to pivot, and whereby he may exercise his calf muscles by periodically exerting an additional upwardly directed force against said press via Donkey Raise, said Donkey Raises being performed by flexing his calf muscles, like a ballet dancer, whereby he may perform continuous tension sets.

4,346,888

WEIGHT LIFTING EXERCISING APPARATUS HAVING A MOVABLE CARRIAGE

William Szabo, 10126 Langmoir Ave., Sunland, Calif. 91040

Filed Jul. 7, 1980, Ser. No. 166,077
Int. Cl.³ A63B *21/06*
U.S. Cl. 272—118 **32 Claims**



1. A weight lifting exercising apparatus comprising:

(a) a base structure for disposition on a floor or other supporting surface,

(b) a generally upright frame associated with the base structure and extending upwardly therefrom,

(c) a vertically shiftable carriage associated with said frame and base structure and capable of being vertically movable against one or more weights,

(d) a first pulley operatively mounted on said frame generally above said carriage and at a height normally greater than the height of a user of the apparatus,

(e) a second pulley operatively mounted on said base structure at a height normally less than the height of a user and which is located substantially forwardly of the first pulley,

(f) a third pulley operatively mounted on said frame at a height normally above the height of the user and which is located forwardly of said second pulley and at a position so that it would be substantially immediately vertically above the user of the apparatus,

(g) a fourth pulley operatively mounted on said carriage and located forwardly of said second pulley and rearwardly of said third pulley

(h) cable means operatively engagable with said carriage and with one or more weights and capable of being selectively trained about any two or more of said first and second and third and fourth pulleys in a desired configuration selected to perform a certain weight lifting exercise, and

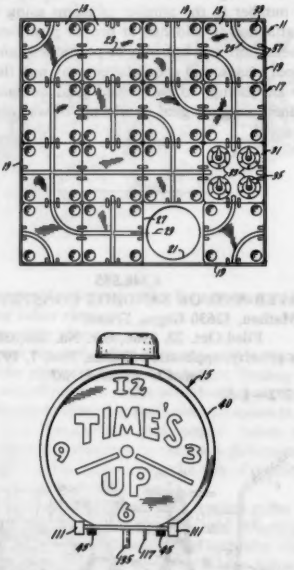
(i) handle means operatively connected to said carriage and operatively coupled to said cable means through said carriage, said handle means being engagable by a user to apply a force thereto to thereby attempt to shift the carriage against the one or more weights.

4,346,889

BOARD GAME WITH PATH CREATING TILES FOR VEHICLE

Gordon A. Barlow, and John R. Krutsch, both of Glenview, Ill., assignors to Gordon Barlow Design, Skokie, Ill.

Filed Feb. 2, 1981, Ser. No. 230,615
Int. Cl.³ A63F *9/00, 9/06*
U.S. Cl. 273—1 GA **5 Claims**



1. A board game including:

a plurality of generally similar rectangular tiles slidable relative to one another to form a rectangular pattern with one vacant space equal in size to a tile,

at least one groove formed in the top surface of some of said tiles and more than one groove formed in the top surface of other of said tiles with each groove extending from one side edge of a tile to another side edge of a tile with all grooves intersecting the side edges of its tile at the midpoint of each side edge so that continuous paths can be formed on adjacent tiles if each adjacent tile has a groove extending to its side edges that is contiguous to an adjacent tile or discontinuous paths can be formed if one of the tiles does not have a groove extending to its side edge that is contiguous with an adjacent tile,

a self-propelled vehicle adapted to move across the tiles, said vehicle having guide means which ride in the grooves to steer the vehicle across the tiles,

an alarm carried by said vehicle, and

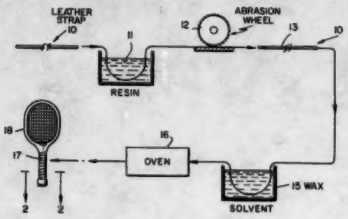
means to sound the alarm when the vehicle reaches the side edge of a tile.

4,346,890

LEATHER GRIP

Bernard Kaminstein, 329 Franklin, Paramus, N.J. 07652

Filed Jan. 25, 1979, Ser. No. 6,459
Int. Cl.[3] A63B 49/08; B32B 9/02
U.S. Cl. 273—73 J 8 Claims



1. An improved leather grip comprising a base handle and a porous natural leather piece covering said handle, said leather piece comprising an outer roughened gripping surface, the structure of said leather piece on and below said surface and within said leather including an incorporated tackifier resinous thermoplastic material in the structure, said thermoplastic material including a thermoplastic plastic selected from the group consisting of a polyvinyl ester, a polyacrylic, polystyrene, a polybutadiene or copolymer thereof, a polyvinylhalogen, polyvinylidene chloride, a nitride, and neoprene, said thermoplastic material including a first solvent, and also including a plasticizer selected from the group consisting of tricresyl phosphate, dibutyl phthalate, dioctyl phthalate, a polycarboxylic acid polyester of a nuclearly halogenated aryl ether alcohol, butyl phthalyl butyl glycolate, dioctyl sebacate, di-(2-ethylhexyl) tetrachlorophthalate, ethylene, glycol dioleate, and a polyester plasticizer, said structure of said leather piece having an organic second solvent solution selected from the group consisting of an aliphatic solvent, benzene, xylene and toluene, and containing in solution a solvated form of a wax selected from the group consisting of beeswax and a microcrystalline wax, formed and absorbed into, and dispersed throughout, said porous leather piece on and below said roughened surface, said wax being present in from about 5 percent by weight to 15 percent by weight of the total solution, said leather piece being in the form of a strip which is wound around said handle and bonded thereto.

3. A method for forming an outer roughened gripping surface on a porous natural leather piece, and thereby improving the grip of leather, comprising:

(a) providing a porous natural leather piece;

(b) incorporating into the structure of said leather piece, on and below said surface and within said leather, an included tackifier resinous thermoplastic material in the structure, said thermoplastic material including a thermoplastic plastic selected from the group consisting of a polyvinyl ester, a polyacryllic, polystyrene, a polybutadiene or copolymer thereof, a polyvinylhalogen, polyvinylidene chloride, a nitride, and neoprene, said thermoplastic material including a first solvent, and also including a plasticizer selected from the group consisting of tricresyl phosphate, dibutyl phthalate, dioctyl phthalate, a polycarboxylic acid polyester of a nuclearly halogenated aryl ether alcohol, butyl phthalyl butyl glycolate, dioctyl sebacate, di-(2-ethylhexyl) tetrachlorophthalate, ethylene, glycol dioleate, and a polyester plasticizer;

(c) roughening at least said surface of the leather;

(d) absorbing into said leather piece, on and below said roughened surface, by applying onto said roughened surface by spraying or brushing, and forming into and dispersing throughout said roughened surface, an organic second solvent solution selected from the group consisting of an aliphatic solvent, benzene, xylene and toluene, said second solvent containing in solution a solvated form of a wax selected from the group consisting of beeswax and a microcrystalline wax; and

(e) drying said leather piece, so that said wax containing second solvent is dispersed in and absorbed throughout the porous leather piece.

4,346,891

RACKETS

David Epstein, 8A Ground floor, Tung Shan Ter., Stubbs Rd., Hong Kong, Hong Kong

Filed Aug. 6, 1979, Ser. No. 64,308
Claims priority, application United Kingdom, Aug. 4, 1978, 32228/78
Int. Cl.[3] A63B 49/02
U.S. Cl. 273—73 C 3 Claims

1. A tennis racket comprising:

a head,

a grip whose length is sufficient for two handed use,

a neck portion joining said head and said grip, said neck portion and said grip comprising a handle, an open frame defining said head and comprising two sides which are substantially straight and parallel to one another and to the axis of the handle and rounded substantially semi-circular ends joining said two sides,

said frame having a width which is approximately 9",

the racket having an overall length which is approximately 27" with said frame about twice as long as said width of said frame, whereby the neck is much shorter than in a conventional tennis racket,

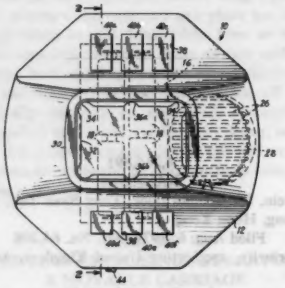
two sets of strings extending across said open frame to define a strung area, said sets of strings comprising parallel strings in each set, said strings of one set crossing said strings of said other set at an angle of about 90°, and said strings of said two sets being interwoven with one another,

a sweet spot defined by said strung area, said sweet spot being in the shape of an elongated oval whose elongation is substantially parallel to and extends along the line of said axis of the handle, and said sweet spot extending substantially closer to the handle than in a conventional tennis racket.

4,346,892
ELECTRONIC POOL GAME

Garry E. Kitchen, 137 New Bridge Rd.; Steven G. Kitchen, 520 Knoll Rd., both of New Milford, N.J. 07646, and James C. Wickstead, Pitney Rd. & W. Main St., Mendham, N.J. 07945

Filed Feb. 15, 1980, Ser. No. 121,950
Int. Cl.³ A63F 9/02
U.S. Cl. 273—85 G 19 Claims



1. An electronic pool game comprising matrix display means for providing a representation of the playing surface of a pool table; driving and control circuit means for applying driving signals to said matrix display means for the positioning of indicia representative of pool balls at discrete locations on said matrix display means, including a cue ball, and for providing further driving signals to said matrix display means for providing indicia representative of intended direction of displacement of said cue ball indicia; manually operable input switch means coupled to said driving and control circuit means for selective application of control signals to said driving and control circuit means for the selective positioning of said direction indicia and for the selective initiation of the displacement of said cue ball indicia in the direction determined by the positioning of said direction indicia, said driving and control means including means for detecting the duration that said input switch means is maintained in a selected state, and means for displacing the cue ball indicia over a distance representative of velocity of displacement, said velocity displacement being proportional to at least a portion of the duration that said input switch means is maintained in said selected state.

4,346,893
REMOTE CONTROLLED SPORTS GAME

Edmund E. Landsinger, Torrance, and Denis V. Bosley, Rancho Palos Verdes, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

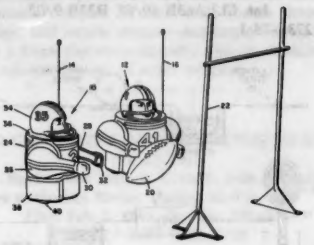
Filed Oct. 9, 1980, Ser. No. 195,717
Int. Cl.³ A63F 7/06; A63H 29/22, 30/02
U.S. Cl. 273—85 F 14 Claims

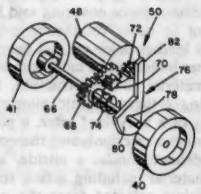
1. In a remotely controlled sports game, the combination comprising:

first and second figures, each of said figures having motor means and radio signal receiving means of different operating frequencies, said receiving means including a manually operable switch for energizing said motor means in a first direction and for driving said motor means in the reverse direction in response to a received radio signal;

first and second radio signal transmitting means, each of said transmitting means having an operating frequency corresponding to the operating frequency of the receiving means of one of said figures;

drive means within each of said figures operable in response to actuation of the transmitting means associated therewith for manipulating said figures on a surface, said drive means including a pair of drive wheels coupled to a common axle and operable through said motor means, with means pivotally coupled to said common axle in proximity to one of said drive wheels and pivoted in response to the reverse direction of operation of said motor means for contacting the surface and for lifting the proximate drive wheel from the surface for pivoting said figure about the point of contact for the timed duration of the received radio signal;





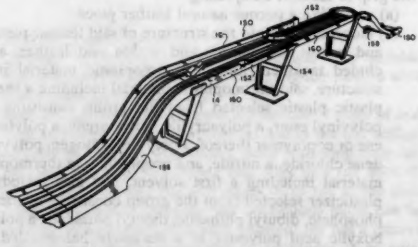
game object means having a configuration for being manipulated on a surface upon impact with said figures in response to manipulation thereof by an operator; and

game goal means configured for positioning on a surface for enabling the operator to direct said game object means toward said goal means for effecting scoring.

4,346,894
DRIVER SKILL TEST FOR TOY MINIATURE VEHICLES

Julius Cooper, New Hyde Park, and Neil Tilbor, Fresh Meadows, both of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Filed Oct. 27, 1980, Ser. No. 200,824
Int. Cl.³ A63F 9/14
U.S. Cl. 273—86 B 5 Claims



1. In a toy vehicle game including a relatively flat slotless track having spaced sidewalls defining at least a pair of lanes therebetween, at least one controllable toy vehicle including means for biasing said vehicle into one or another of said lanes for guiding engagement with the adjacent track sidewall, and player operable control means for varying the speed of the controllable vehicle and selectively actuating said biasing means to cause said controllable vehicle to switch lanes, the

improvement comprising a track section having interrupted sidewall portions in each of said sidewalls through which a vehicle may pass when moving in the adjacent track lane whereby the player must actuate said control means to cause the controllable vehicle to switch lanes from said adjacent track lane to the other lane to avoid having the controllable vehicle leave the track; each of said interrupted sidewalls having an elongated opening formed therein extending parallel to their respective adjacent lanes; and means for adjusting the length of said openings including a wall section slidably mounted in said track section for movement parallel to the track sidewall across its associated opening.

4,346,895

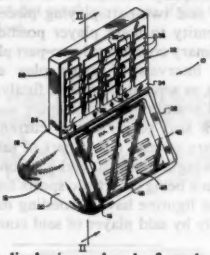
PLAYING CARD CADDY

Wanda J. Brownlee, 1131 Elmwood, Lewisville, Tex. 75067

Filed Feb. 17, 1981, Ser. No. 235,107

Int. Cl.³ A63F *1/10*

U.S. Cl. 273—150 **1 Claim**



1. A holder for displaying a hand of cards comprising, in combination:

a flexible support bag having a wide bottom panel, a relatively narrow top panel, and sloping side panels interconnecting the top and bottom panels;

a volume of flowable, aggregate material disposed within said support bag;

an upright card display panel secured to the top panel of the support bag, said card display panel including an array of card pockets arranged in row and columns; and,

an instruction sheet display panel secured to one of the sloping side panels for receiving and displaying a sheet of printed instructions.

4,346,896

PORTABLE GOLF PRACTICE MAT

Leonard V. Russell, Cobham, and Derek N. Beaney, Woking, both of England, assignors to Universal Materials Company Limited, Middlesex, England

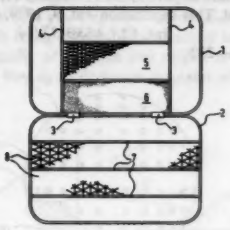
Filed Feb. 6, 1981, Ser. No. 232,373

Claims priority, application United Kingdom, Feb. 8, 1980, 8004322

Int. Cl.³ A63B *69/36*

U.S. Cl. 273—195 A **6 Claims**

1. A portable golf practice mat comprising two frames, means hinging said frames together and forming a hinge axis, first means secured within one of said frames and defining a first area arranged such that a golfer can stand thereon so as to stabilise said mat during use, and second means secured within the order of said frames and defining a second area forming at least one playing surface wherein a golf ball can be placed, said second means including a first playing surface region and a second playing surface region, said first playing surface region comprising one of turf and simulated turf, and said second playing surface region arranged to hold a tee in a playing



position so that a golf ball can be placed on the tee and driven from the tee.

4,346,897

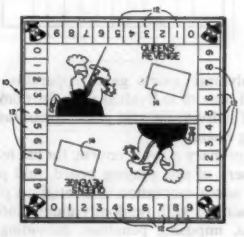
BOARD GAME APPARATUS

Harry A. Sisak, 24 Hearthstone Dr., Reading, Pa. 19606

Filed Sep. 12, 1980, Ser. No. 186,437

Int. Cl.³ A63F *3/00*

U.S. Cl. 273—271 **13 Claims**



3. A game board apparatus for combining chance play and the performance of mathematical operations comprising:

a. a game board each side of which contains a plurality of numbered spaces;

b. a set of markers to be placed on said numbered spaces on the board;

c. at least two dice marked as follows:

i. a first die with a first figure on one face, and a second figure on another face;

ii. a second die having three faces marked with a third figure and three faces marked with a fourth figure; and

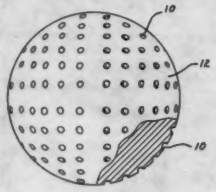
d. at least one deck of cards including at least two cards containing different figures thereon, and the remainder of which include numerical values thereon.

4,346,898

PUTTING GOLF BALL

Frank C. Badke, 1617 Riverside, McDade Estates, Conroe, Tex. 77301

Continuation-in-part of Ser. No. 935,904, Aug. 23, 1978, abandoned. This application Jul. 9, 1979, Ser. No. 55,507
Int. Cl.³ A63B 37/14
U.S. Cl. 273—232 7 Claims



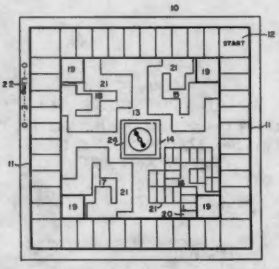
1. A putting golf ball having a plurality of concave surface depressions over the surface thereof, each of said depressions having a surface diameter in the range of 0.020 inches to 0.080 inches having improved line of putting stroke accuracy.

4,346,899

BOARD GAME FEATURING OLYMPIC SPORTS

George E. Nuebling, Sr., Box 940, Rte. 1, Hollywood, Md. 20636

Filed Sep. 16, 1980, Ser. No. 187,483
Int. Cl.³ A63F 3/00
U.S. Cl. 273—244 2 Claims



1. An olympic sports game apparatus with elements of chance and tests of individual skill, for competitive play by a plurality of individuals, said game apparatus having

a playing board,

a closed primary playing course, for use by all players, at the periphery of said playing board, said primary course divided into a succession of contigious playing spaces that are inscribed with randomly unique information granting awards, imposing penalties, providing sanctuaries, and instructing game play,

a plurality of distinctively marked secondary playing courses for individual and challenged play thereon, said secondary courses arranged upon a central area of said playing board, each said secondary playing course featuring a major classification of related olympic sports, each said secondary playing course being divided into a randomly oriented succession of numbered contigious playing spaces wherein said numbered playing spaces are inscribed with randomly varying informations granting awards, imposing penalties, and instructing secondary course game play,

a combination of means for regulating movements of said players upon said primary and said secondary courses for play, and

means for displaying, upon said primary and said secondary courses, the positions of each said player during all turns at play, wherein the improvement comprises:

(a). a first combination of chance and skill apparatus for regulating play upon said primary course, said first combination further comprising printed instructions for game play randomly distributed among said playing spaces of said primary course, a die for providing a further element of chance, and a spinner for providing a test of said players' individual skills;

(b). a second combination of chance and skill apparatus for regulating play upon said plurality of secondary course, said second combination further comprising at least one of said numbered spaces of said secondary courses having instructions for play thereon, a deck of special cards for assigning points and for specifying player movements, a plurality of decks of event cards, a deck thereof distinctively marked to correspond to each secondary course, said event cards for identifying specific olympic games to be played and for setting winning point values, and a spinner for a test of said players' individual skills; and

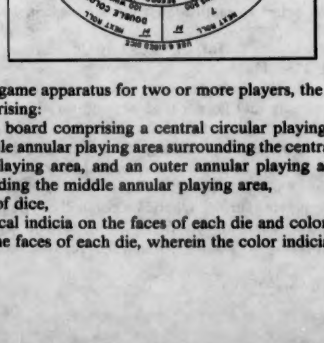
(c). a plurality of two-part playing pieces for displaying player' positions upon said primary and said secondary courses, during turns at play, each said two-part playing piece uniquely colored so as to idenfify its assigned player, said two-part playing piece for use as a combined entity to mark player position, during play, on said primary course, said two-part playing piece for use, during intervals of game play on said secondary courses, as separated entities, firstly, to mark said player's last position on said primary course, and secondly, to mark said player's then current progress on said secondary course, a first part of said two-part playing piece being a pedestal, and a second part of said two-part piece being an artistic sports figurine, said pedestal and said figurine having bonding means for temporary assembly by said player of said combined entity.

4,346,900

GAME BOARD AND DICE USABLE THEREWITH

Stewart Lamlee, 55 W. 86th St., New York, N.Y. 10024

Continuation of Ser. No. 893,756, Apr. 5, 1978, abandoned. This application Aug. 25, 1980, Ser. No. 181,190
Int. Cl.³ A63F 3/00, 9/04
U.S. Cl. 273—274 1 Claim



1. In a game apparatus for two or more players, the apparatus comprising:

a game board comprising a central circular playing area, a middle annular playing area surrounding the central circular playing area, and an outer annular playing area surrounding the middle annular playing area,

a pair of dice,

numerical indicia on the faces of each die and color indicia on the faces of each die, wherein the color indicia on the

opposite faces of a single die are the same and wherein the color indicia on adjacent faces of a single die are different,

a plurality of pairs of dice, each pair comprising dice shaped differently than the other pairs,

die shape indicating means on the game board defining the shape of the dice to be used with the game board,

a first series of arcuate segments comprising the middle annular playing area, and first means on each of the first series of arcuate segments indicating a winning outcome determined by numerical indicia displayed on the upturned faces of cast dice,

a second series of arcuate segments comprising the outer annular playing area, second means on the second series of arcuate segments indicating a winning outcome determined by color indicia displayed on the upturned faces of cast dice, and third means on the second series of arcuate segments indicating a winning outcome determined by numerical indicia displayed on the upturned faces of cast dice,

chips for marking a bet in the middle annular playing area and in the outer annular playing area,

first bet marking means for marking a first bet in the central circular playing area, and

fourth means on the central circular playing area indicating if the first bet is won or lost, said second means on the second series of arcuate segments indicating the placement of the first bet marking means if the first bet is neither won nor lost.

4,346,901

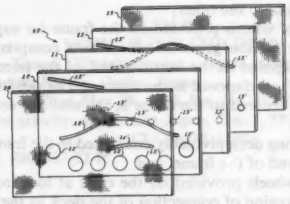
LIVE FIRE THERMAL TARGET

Donald W. Booth, Huntsville, Ala., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 25, 1981, Ser. No. 247,467

Int. Cl.³ F41J *1/00, 9/13, 5/08*

U.S. Cl. 273—408 **8 Claims**



1. A thermal target comprising:

resistive material having at least first and second surfaces;

insulating means disposed upon at least the first and second surfaces of said resistive material and having portions of insulation removed therefrom at predetermined locations; and

continuous electrode means disposed upon said insulation means and fastened to at least the first and second surfaces of said resistive material for applying an electrical potential thereto.

4,346,902

HANDBALL GAME UTILIZING PAIRED TETHERED BALLS

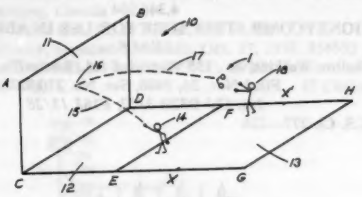
Norwood R. Warehime, 704 W. 34th St., Baltimore, Md. 21211

Continuation-in-part of Ser. No. 62,578, Aug. 1, 1979, abandoned. This application Sep. 2, 1980, Ser. No. 182,946

Int. Cl.³ A63B *71/04, 43/00*

U.S. Cl. 273—411 **9 Claims**

1. A handball type game and apparatus therefor, for individual and team players, played on a court layout, comprising a horizontal and a vertical playing surface means including a game area means, and a pair of tethered spherical balls, said tethered balls being especially suited for one of said players to make one-handed throws, that is, both of said tethered balls are thrown simultaneously from one hand, and also for one of said players to make two-handed catches, that is, one ball each of said tethered balls is caught separately and simultaneously in the hands of one of said players, each ball of said pair of tethered spherical balls being substantially identical in nature and consisting substantially of resilient and pliable organic material, each said ball having an optimum diameter of about 1⅛ to



2⅞ inches (4.2 to 7.4 cms), each said ball having an optimum weight of about 1.1 to 3.5 ounces (31 to 100 gms), each said ball having an optimum relative vertical rebound characteristic value of about 50 to 90 percent, said tethered balls being connected together by a strong, flexible, inelastic cord, said cord having an optimum length between individual balls of about 10 to 20 inches (25.4 to 50.8 cms), whereby said players normally utilize said tethered balls on said court layout for throwing, catching, and rebound play, in a prescribed manner, in order to gain maximum point score.

4,346,903

HIGH-PRESSURE SEAL IN PISTON

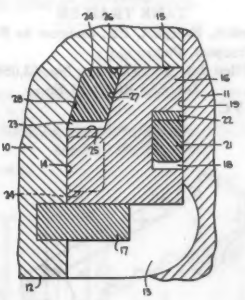
Siegfried Helermann, Waltrop, Fed. Rep. of Germany, assignor to Klockner-Werke AG, Duisburg, Fed. Rep. of Germany

Filed Mar. 18, 1981, Ser. No. 245,095

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1980, 8007319[U]

Int. Cl.³ F16J *15/18*

U.S. Cl. 277—58 **4 Claims**



1. In a piston and cylinder arrangement wherein the piston has an annular recess therein adjacent a high-pressure area defined between the piston and the wall of the cylinder, high-pressure seal means mounted in said recess, comprising: a one-piece backup support ring defining together with the cylinder wall a first, annular sealing chamber; an annular, elastomeric dynamic seal ring disposed in said chamber; said support ring further defining together with the piston a second, annular sealing chamber; an annular, elastomeric static seal ring disposed in said second chamber; said second chamber being defined by a pair of spaced apart end faces and a pair of

spaced apart conical faces extending therebetween; said recess having an annular side wall lying parallel to the piston axis and an end wall lying perpendicular thereto; said conical faces sloping radially outwardly in a direction toward said end wall; and said static seal initially encircling said side wall and being shifted into said second sealing chamber by said support ring upon assembly thereof; said static seal being radially expanded by said conical faces when disposed in said second sealing chamber to thereby tightly engage said piston, whereby to improve the seal between said piston and said cylinder.

4,346,904

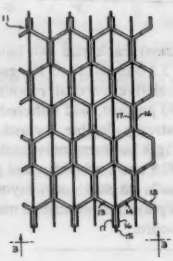
HONEYCOMB STRUCTURE FOR USE IN ABRADABLE SEALS

Shelton Watkins, Jr., 185 Westwind Rd., Louisville, Ky. 40207

Filed Nov. 26, 1980, Ser. No. 210,822

Int. Cl.³ B32B *3/12*; F16J *15/28*

U.S. Cl. 277—236 **6 Claims**



1. In an improved honeycomb structure of the type which conventionally includes a plurality of semi-hexagonal elongate strips joined together along adjacent engaging strip sections, the improvement comprising an elongate ribbon having a width less than the width of said strips interposed between successive ones of said strips, the edges of said ribbon being within the top and bottom margins of the hexagonal cell structure formed by said joined strips.

4,346,905

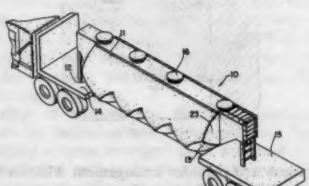
TANK TRAILER

Andrew Smetanick, Freeport, Pa., assignor to Freeport Transport, Inc., Freeport, Pa.

Filed Jul. 30, 1979, Ser. No. 62,050

Int. Cl.³ B62D *53/06*

U.S. Cl. 280—5 C **6 Claims**



1. A tank trailer for transporting dry and liquid flowable materials comprising a horizontally disposed substantially cylindrical tank having front and rear transverse end walls, said tank supported upon a longitudinal frame element structure along its bottom portion and said frame structure having upwardly inclined ends terminating at the end walls of said tank, a hopper structure on each of said tank end walls and inclining upwardly and outwardly from the bottom portion of said end wall, said hopper structure having a width less than one third of the diameter of said tank, front and rear platforms adapted to carry goods thereon connected to and extending horizontally away from the ends of said frame structure at the bottom portions of the respective end walls and each platform having a width approximately equal to the diameter of the tank, said tank, frame structure and platforms defining a single structural unit, said hoppers each projecting over a portion of a respective platform, and vertical support means between each of said platforms and the upper end of the respective hopper structure.

4,346,906

ROLL PALLET

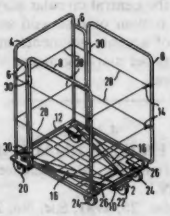
Joseph F. Thorpe, Somerset, England, assignor to Cheddar Valley Engineering Limited, England

Filed Jun. 24, 1980, Ser. No. 162,494

Claims priority, application United Kingdom, Jun. 26, 1979, 7922229

Int. Cl.³ B62B *3/02*

U.S. Cl. 280—33.99 H **7 Claims**



1. A roll pallet comprising

a frame including two limbs which converge from one end of the frame to the other,

a plurality of wheels provided on the frame for supporting the pallet on the ground, said wheels comprising two wheels disposed at the said one end of the frame and a further wheel disposed at the other end of the frame,

an end wall secured to the frame at the said one end of the frame,

a load-carrying deck pivotably connected to the frame at the said one end of the frame, and

stabilizing wheels provided on the deck at locations away from the region of connection of the deck to the frame

the deck being movable between a load-bearing position in which the deck is generally parallel to the ground on which the pallet stands with the stabilizing wheels then being on or adjacent the ground for this position, and a raised position in which the deck is generally parallel to the end wall, the convergent limbs of the frame being such that these limbs can enter between the corresponding limbs of a similar pallet at the same vertical level when the deck is in the raised position thereof.

4,346,907

SHOPPING CART WITH AUXILIARY LOAD CARRIER

Julian B. Swann, 2951 Riverside Dr., Apt. 510, Ottawa, Ontario, Canada (K1V 8W6)

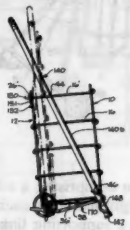
Filed Mar. 24, 1980, Ser. No. 133,078

Int. Cl.³ B62B *1/04*

U.S. Cl. 280—47.18 **28 Claims**

1. In a shopping cart of the type having a collapsible basket with a front and a back and with sides formed by ribs which provide a parallelogram linkage connecting the front and the back and allow the basket to be folded from an open to a collapsed condition while the front and back remain substantially parallel, the basket having wheels mounted on axle means extending adjacent the bottom of the basket back, and

the cart further comprising a frame including a handle bridging the top of the basket and legs which straddle the basket, the frame being pivoted to opposite sides of the basket adjacent the top of said back and the legs being located by guide members extending from the lower frontal area of the basket so that the frame and basket constitute two foldably connected portions movable from an open condition to a collapsed condition, said legs including stop means for supporting the basket front in said open condition; the improvement comprising an auxiliary, foldable load carrier pivotably mounted on a first of said foldably connected portions, said carrier having a folded condition close to the basket when the basket is collapsed and being



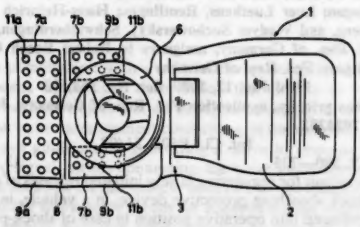
movable to an operative condition when said portions are in a folded condition proximate to said collapsed condition, in which operative condition the carrier projects beyond one of said portions in a plane below said axle means to provide a load carrying surface forming a substantial right angle with said one portion and having a clear space thereabove, said carrier and the second of said portions having interengaging means effective when said carrier is in the operative condition firstly to locate the portions at said folded condition, secondly to support the carrier, and thirdly to inhibit upward pivoting of the carrier so that the cart can stand upright on a level surface contacted by the wheels and carrier only.

4,346,908

VEHICLE FOR CHILDREN

Kenzou Kassai, Higashishimizu, Japan, assignor to Kassai Kabushiki Kaisha, Osaka, Japan

Filed May 29, 1980, Ser. No. 154,239
Claims priority, application Japan, Jun. 1, 1979, 54-74876[U]
Int. Cl.³ B62M *1/00*
U.S. Cl. 280—87.02 R **3 Claims**



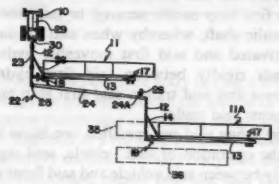
1. A play vehicle for children comprising a vehicle body having front and rear ends, pair of front and rear wheels mounted at said front and rear ends respectively, a handle mounted on said vehicle body intermediate said front and rear ends, a seat mounted on said vehicle body to the rear of said handle, means to hingedly mount said seat to said vehicle body, a base mounted on said vehicle body to the front of said handle, said base comprising a plurality of upwardly projecting bosses arranged in a lattice pattern for receiving blocks for block building, said vehicle body, said handle and said seat all being so configured that a child can push said vehicle forward by straddling said seat and kicking the ground.

4,346,909

TRANSPORT MECHANISM FOR SINGLE AND MULTIPLE UNIT PULL TYPE IMPLEMENTS

David R. Hundeby, Elbow, Canada, assignor to Macdon Industries, Winnipeg, Canada

Filed Oct. 15, 1979, Ser. No. 85,018
Claims priority, application Canada, Oct. 27, 1978, 314551
Int. Cl.³ B60D *1/14*; A01B *73/00*; A01D *55/00*
U.S. Cl. 280—411 C **17 Claims**



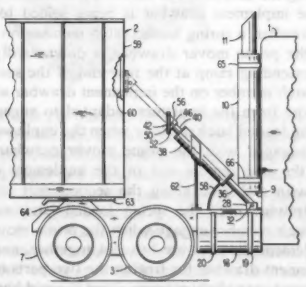
1. In pull type implements such as swathers and the like which include a frame including a transverse rear member, the improvements comprising means for mounting at least two such implements selectively in field working position whereby said implements are in echelon one behind and to one side of the other, and at least one transport position, said means including a rear offside wheel assembly for each implement operatively mounted thereto for selective castoring action from a straight ahead orientation when in field working position, to orientations at an angle to the fore and aft axis of the implement when in the transport position, means to detachably lock said wheel assemblies in any of the said orientations, a hitch pole assembly for each implement extending forwardly from one end of said transverse rear member, said hitch pole assembly of said one implement being connected by the front end thereof to adjacent the outboard end of said transverse rear member of the other of said implements.

4,346,910

ANTI-JACKNIFE DEVICE

Milton A. Beck, Marion, S.C., assignor to Larry Harold Kline, Charleston, S.C.

Filed Jul. 31, 1980, Ser. No. 173,916
Int. Cl.³ B62D *53/06*
U.S. Cl. 280—432 **19 Claims**



1. A device for use with a vehicle with a rear pivot connec-

tor and a trailor connectable to said rear pivot connector comprising:

a. a structure secured to a horizontal surface of said vehicle, forward of said rear pivot connector, including mechanical means that is operative, when activated, to extend rigidly between said vehicle and the front vertical surface of said trailer;

b. activation means secured to said vehicle and operative to activate said mechanical means at a pre-specified condition during the operation of said vehicle; and

c. said mechanical means comprising:

(1) a first hydraulic cylinder means secured to said vehicle;

(2) a first moveable hydraulic shaft secured within said first hydraulic means and operative when activated to extend rigidly between said first hydraulic cylinder means and said trailer; and

(3) a first stop means secured to said first moveable hydraulic shaft, whereby when said mechanical means is activated and said first moveable hydraulic shaft extends rigidly between said first hydraulic cylinder means and said trailer, said first stop means will press against said trailer,

whereby when said pre-specified condition is reached during the operation of said vehicle, said structure extends rigidly between said vehicle and said front vertical surface of said trailer holding said vehicle and said trailer rigidly together.

4,346,911

HITCH

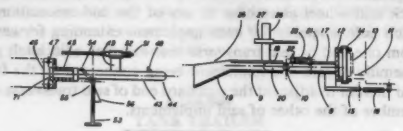
Colin R. Wiese, Fairlight, Milbrulong, New South Wales 2737, Australia

Filed Aug. 25, 1980, Ser. No. 181,279

Claims priority, application Australia, Sep. 17, 1979, PE0488; Nov. 22, 1979, PE1431

Int. Cl.³ B60D *1/08, 1/14*

U.S. Cl. 280—478 R **10 Claims**



4. A hitch comprising a prime mover drawbar, an implement drawbar, a first part of the prime mover drawbar connectable to a prime mover in normal manner, a second part of the prime mover drawbar, a pivot having a horizontal axis between the said first and second parts of the prime mover drawbar, means for holding the said first and second parts substantially in line while the implement drawbar is being joined to the prime mover drawbar, a spring loaded latch member on the second part of the prime mover drawbar, a downwardly and rearwardly extending ramp at the rear end of the second part, a second latch member on the implement drawbar at or near its end remote from the implement adapted to engage with the said spring loaded latch member when the implement drawbar is fully engaged with the prime mover drawbar, the ramp guiding the said remote end of the implement drawbar to engage with and slide along the second part of the prime mover drawbar until the spring loaded latch member and second latch member engage when the prime mover drawbar and implement drawbar are brought together, and means on the implement drawbar for freeing the two parts of the prime mover drawbar to allow rotation about the said horizontal axis when the prime mover drawbar and implement drawbar are fully engaged.

4,346,912

BASKET FOR STROLLER

Linda Habib, 345 E. 73rd St., New York, N.Y. 10021

Filed Apr. 12, 1979, Ser. No. 29,438

Int. Cl.³ B62B *7/08*

U.S. Cl. 280—644 **9 Claims**

1. The combination comprising a collapsible stroller of the type having two upright members each with a handle thereon and means including a supporting linkage extending between the two upright members for collapsing the stroller from a use position where the upright members are spaced apart to a collapsed position where the upright members are relatively close together, said basket including a back, sides, a flat bottom for accepting parcels to be placed thereon and a front all of a non-foldable material which are joined together, said back and said sides being of substantially the same height and said front being of substantially from about only one-quarter to about only one-third the height of the back and the sides and engaging the supporting linkage while leaving the major portion of the basket front open, a respective flexible means for attaching the basket in a freely hanging manner only to a respective upright member and only at one point thereon, there being only two of said attaching means which serve as the only means for attaching the basket and each attaching means including means for a pivotal connection to the upper end of a respective side of the basket and means for a slidable connection to the respective upright member with the open front of the basket facing the upright members to trap articles placed in the basket against the stroller, the length of each said attaching means being such as to permit the stroller to be collapsed without removing the non-foldable basket from the stroller.

4,346,913

FALSE RELEASE REGISTERING CIRCUIT FOR COLLISION PROTECTIVE DEVICES

Werner Schrauf, Schwieberdingen; Peter Werner, Wiernsheim-Iptingen; Luer Luetkens, Reutlingen; Hans-Heinrich Maue, Asperg, and Wadym Suchowerskyj, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 12, 1980, Ser. No. 158,693

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1979, 2924252

Int. Cl.³ B60R *21/08*

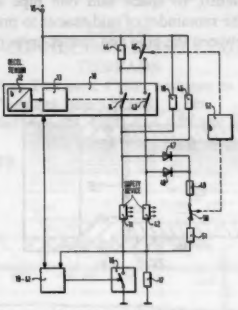
U.S. Cl. 280—735 **13 Claims**

1. A circuit for registering falsely initiated releases of at least one shock-absorbing protective device, in a vehicle, intended to be released into operative position in case of shock-producing accident, comprising, in addition to a first deceleration sensor (12,13) and at least one normally open switch (14,43) operable in response thereto and connected in series with at least one electrically operated shock-absorbing protective device (11,42) for control of the release thereof:

a second deceleration sensor (52) responsive to a rate of deceleration exceeding a predetermined minimum rate and a normally closed switch (50) operable in response thereto;

a storage register (49) responsive to a current exceeding a

predetermined minimum current connected in a series circuit combination with said normally closed switch (50), said series circuit combination (49,50) being connected in a circuit branch disposed in parallel with said at least one protective device (11,42),



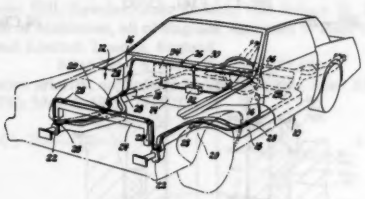
whereby registration of a current in said storage register (49) exceeding said minimum is indicative of a falsely initiated release of said protective device, by virtue of the failure of said second sensor (52) to open said normally closed switch (50) in response to deceleration before the release of said protective device.

4,346,914

ACOUSTIC EMISSION AUTOMOTIVE CRASH SENSOR

Gerald D. Livers, Santa Barbara, and Frank L. Benedict, San Pedro, both of Calif., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 17, 1980, Ser. No. 217,245
Int. Cl.³ B60R *21/08*
U.S. Cl. 280—735 4 Claims



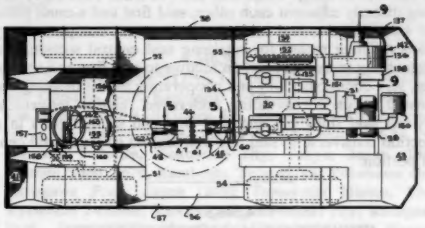
1. In combination with a vehicle having structure emitting an acoustic signal upon deformation thereof due to vehicle impact with an object and an occupant restraint, an acoustic emission sensor arrangement comprising, in combination, elongate wave guide means generating a wave in response to an acoustic signal, means connecting the wave guide means to a discrete location on the vehicle structure to provide an entry site into the wave guide means for acoustic signals originating in the vehicle structure upon deformation thereof, a sensor generating an electrical output signal in response to a predetermined force impressed thereon, means mounting the sensor on the vehicle at a location remote from the entry site, means connecting the wave guide means to the sensor to generate an electrical output signal in response to acoustic signals emitted from the vehicle structure, and means responsive to the sensor output signal for actuating the occupant restraint when the sensor output signal indicates that a predetermined level of vehicle impact has occurred.

4,346,915

VEHICLE

James C. LeBlanc, 38261 Long St., Mt. Clemens, Mich. 48045

Division of Ser. No. 927,600, Jul. 21, 1978, abandoned. This application May 1, 1980, Ser. No. 145,602
Int. Cl.³ B62D *1/20*
U.S. Cl. 280—779 7 Claims



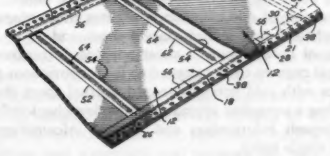
1. In a vehicle having a body, the body having a longitudinal centerline running fore and aft through the middle of the body, an operator's station comprising supporting means for supporting an operator disposed at a forward location of said body, a steering gear assembly mounted on said body and disposed on the side of said supporting means opposite said longitudinal centerline, said steering gear assembly having an arm portion projecting horizontally toward said longitudinal centerline across the driver's legs supporting a steering wheel disposed at said supporting means, at least three vision blocks mounted in a front end of said body adjacent said supporting means, said vision blocks being disposed substantially at eye level of an operator disposed in a normal operating position at said supporting means and being arcuately spaced to provide a panoramic direct line of sight view for the operator.

4,346,916

MULTIPLE PLY BUSINESS FORM AND MANIFOLD ASSEMBLY

Oscar A. Shelton, Denton, Tex., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed May 19, 1980, Ser. No. 151,165
Int. Cl.³ B41L *1/20*; B65D *27/10*
U.S. Cl. 282—11.5 A 16 Claims



1. In a multiple ply business form of the type having at least a first ply, a second ply, and a third ply intermediate said first and second plies, said first and second plies having lateral edge portions and upper and lower edge portions, means for securing said upper and lower edge portions together, said third ply being removable from between said first and second plies, an improvement in said business form comprising first and second side portions and a central portion defining said third ply, said central portion being severed from said first and second side portions, said central portion having first and second edges spaced away from said securing means, said first and second edges thereby being free of said securing means, further means

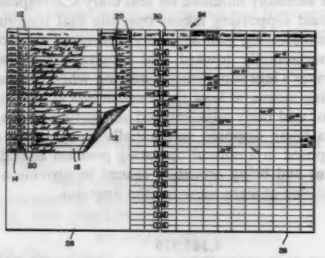
for securing said side portions of said third ply to said lateral edge portions of said first and second plies, said central portion having third and fourth edges in substantially contiguous relationship to said side portions, and at least one set of cooperating and complementary projecting means and cut-out means defined along said side portions and on said third and fourth edges of said central portion, said projecting means and said cut-out means being completely severed from each other and being directly adjacent each other, said first and second plies, said side portions, and said cooperating and complementary means defining means for retaining said central section in a substantially immobile position relative to said first and second plies, said complementary and cooperating means defining the essential means for avoiding undersired relative movement between said third ply and said first and second plies in a direction transverse to said first and second edges of said central portion.

4,346,917

CHECKBOOK ACCOUNTING SYSTEM

Bruce N. Clancy, 118 Via Buena Ventura, Redondo Beach, Calif. 90277

Filed Sep. 25, 1978, Ser. No. 945,483
Int. Cl.³ B42D *12/00*
U.S. Cl. 283—58 **8 Claims**



1. A checkbook register and account record journal system comprising:

a plurality of checkbook register sheets each arranged to receive check information on a single line detachably secured on one end,

each of said register sheets having a plurality of spaced apart parallel lines on the obverse side for recording additional check information,

an account record journal sheet having a plurality of spaced apart parallel lines on the obverse side adapted to be aligned with said lines on said register sheets for indicating specific headings according to task for each check,

the reverse side of said checkbook register sheet adapted to be attached to said record journal sheet, and

said account record journal sheet adapted to receive and hold said register sheets aligned to form contiguous parallel lines with said account record journal sheet thereby providing a complete journal page having check information, deposit information and journal information and from a single entry.

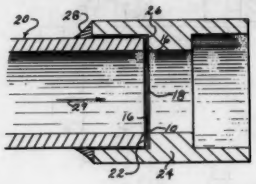
4,346,918

PIPE SPACER USED IN WELDING

Goodwin A. Lycan, P.O. Box 23, Stevensville, Mich. 49127

Continuation-in-part of Ser. No. 36,780, May 7, 1979, abandoned. This application Apr. 3, 1981, Ser. No. 250,620
Int. Cl.³ F16L *13/04*
U.S. Cl. 285—22 **6 Claims**

1. A spacer for positioning between the end of a pipe and an internal annular shoulder of a bore of a fitting into which bore said pipe is inserted in preparation for welding the pipe to the fitting, said spacer including a ring-shaped body, said body having a yieldable offset section serving to increase the effective thickness of said spacer and having an outer diametrical dimension approximating the outer diametrical dimension of said pipe whereby said body abuts one of said pipe end and fitting shoulder at said offset section when positioned between said fitting shoulder and pipe end, said offset section being yieldable sufficiently to space said one pipe end or fitting shoulder from the remainder of said spacer to prevent unyielding abutment between the pipe and spacer upon pipe expansion



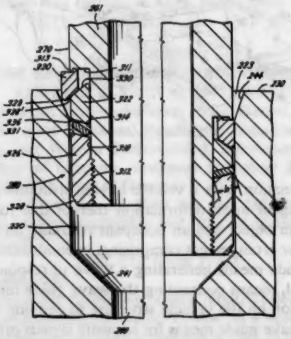
during welding, the improvement comprising a split formed in said spacer body defining spaced ends of the spacer body, said spacer body lying substantially in the same plane except for said offset section, a tab part extending from said spacer body, said tab part projecting generally perpendicularly relative to said plane of the body and constituting means for extending between said fitting and pipe and beyond the fitting to indicate the presence of the spacer when positioned between said pipe end and said fitting shoulder.

4,346,919

REMOTE AUTOMATIC MAKE-UP STAB-IN SEALING SYSTEM

Charles D. Morrill, Bellaire, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Division of Ser. No. 833,553, Sep. 15, 1977, Pat. No. 4,229,027. This application Nov. 6, 1978, Ser. No. 958,313
The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.
Int. Cl.³ F16L *35/00*
U.S. Cl. 285—25 **24 Claims**



1. A sealing system, comprising:

first apparatus having a projecting structure;

second apparatus having a bore therein, said bore being of sufficient size to telescopically receive said projecting structure therein;

seal means for substantially simultaneously forming metal-to-metal seals with said projecting structure and said bore, said seal means including a metal seal gasket; and

actuation means responsive to the telescopic insertion of said

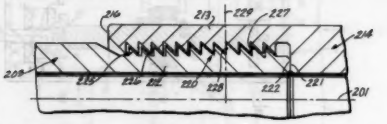
structure into said bore for actuating said seal means, said actuation means including deformation means for forcing said metal seal gasket to deform and form said metal-to-metal seals and reciprocating means for actuating said deformation means.

4,346,920

THREADED CONNECTION USING VARIABLE LEAD THREADS

Patrick E. Dailey, Torrance, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Apr. 28, 1980, Ser. No. 144,347
Int. Cl.³ F16L *15/00*
U.S. Cl. 285—89 38 Claims



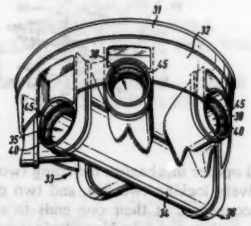
1. A threaded connection for connecting first and second members and subject after assembly to a load of specified magnitude applied in a selected direction along the axis of the threads, and in which the threads as so loaded are uniformly stressed, the threads being of constant pitch throughout their lengths along the members with each thread having a load face which is loaded when said load is applied in said direction to the connection, and characterized in that the load faces of the threads on at least one of the members is defined to have a lead which varies from a constant lead by an amount which, at any given location along the threads, is equal to the amount of net relative deflection due to strain of the members along the axis at such location in response to the application to the connection of the load of specified magnitude in the selected direction.

4,346,921

DRAINAGE INSPECTION CHAMBERS

Anthony Gill, Swanley; John Gosden, and Robert W. Parker, both of Maidstone, all of England, assignors to Reed International Limited, London, England

Filed Mar. 6, 1980, Ser. No. 127,629
Claims priority, application United Kingdom, Mar. 13, 1979, 7908782; May 4, 1979, 7915727
Int. Cl.³ F16L *41/00*
U.S. Cl. 285—110 8 Claims



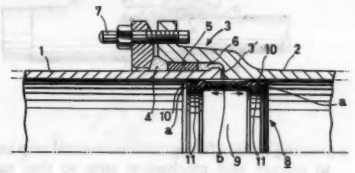
1. A drainage inspection chamber of prefabricated plastic construction having a manhole access and a base with at least one channel in the base extending between an inlet opening and an outlet opening, the base of said prefabricated inspection chamber being formed from plastics material and having an integral side wall structure, circular openings in the side wall structure constituting said inlet and outlet openings, separately formed socket members for receiving inlet and outlet pipes, said separately formed socket members being located at each of said openings, and each said socket member being provided with a resilient sealing member for sealing said socket member with the outer surface of a pipe fitted into the socket member, each said sealing member being so configured and being so arranged relative to its associated socket member that said sealing member also serves simultaneously to seal said associated socket member with the internal surface of the inspection chamber.

4,346,922

DEVICE FOR PREVENTING LEAKAGE AT PIPE JOINTS

Hisao Ohtsuga, 5-26, Kamiosaki 4-chome, Shinagawa-ku, Tokyo, Japan (141); Koji Uzawa, 4-8, Hibarigaoka Kita 2-chome, Hoya city, Tokyo, Japan (188); Takashi Kamuro, 34-18, Nishimachi 5-chome, Kokubunji city, Tokyo, Japan (185); Susumu Sudo, 2670, Kami-iida, Totsuka-ku, Yokahama city, Kanagawa Pref., Japan (245); Tomoyoshi Hirose, 13-2, Kyomachi 2-chome, Kawasaki-ku, Kawasaki city, Kanagawa Pref., Japan (210); Masafumi Miyao, 16-4-1413, Harumi 3-chome, Chuo-ku, Tokyo, Japan (104), and Motoyuki Koga, 9-18, Nakamachi 1-chome, Meguro-ku, Tokyo, Japan (153)

Filed Mar. 21, 1980, Ser. No. 132,543
Int. Cl.³ F16L *21/00*
U.S. Cl. 285—109 11 Claims



1. A device for forming an airtight and watertight seal between the joint of two pipes, said device comprising:

an integral cylindrical member made of an elastic material and having a longitudinal intermediate portion, said cylindrical member being inside of and in contact with the inner peripheral surfaces of the respective ends of two pipes that form a joint between the two pipes, said intermediate portion being radially adjacent to the joint of the two pipes;

two belt members, each respectively positioned around the radial outer peripheral surface of a longitudinal end of said cylindrical member and impregnated with a bonding agent for, when pressure is exerted thereon, oozing the bonding agent therefrom; and

two expanding members, each respectively positioned inside the inner peripheral surface of a longitudinal end of said cylindrical member for radially expanding the respective cylindrical member longitudinal end for exerting pressure on one of said belt members for causing the bonding agent thereof to be oozed therefrom, whereby the radial outer peripheral surfaces of the longitudinal ends of said cylindrical member are respectively bonded to the inner peripheral surfaces of the two pipe ends, thereby forming an airtight and watertight seal between the joint of the two pipes.

4,346,923

APPARATUS FOR JOINING TUBING

Verity C. Smith, Dedham; Robert J. Baker, Pembroke; Wylie W. Barrow, Jr., and H. Daniel Doane, both of Duxbury, all of Mass., assignors to Vaponics Inc., Plymouth, Mass.

Filed Aug. 23, 1979, Ser. No. 69,516
Int. Cl.³ F16L *17/02*
U.S. Cl. 285—340 1 Claim

1. An adapting and coupling arrangement for forming a firm mechanical joint between a first section of tubing of a metal selected from a group consisting of titanium, tantalum, zirco-

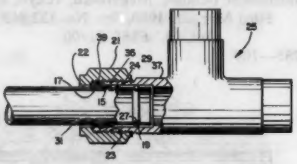
nium and stainless steel and a second section of tubing of a metal selected from said group, said second section having an open end adapted to telescopingly receive said first section, each of said first and second sections of tubing having inner and outer surfaces, comprising

a sealing means made of noncontaminating material, mounted on said outer surface of said first section for providing a fluid-tight seal between said outer surface of said first section of tubing and said inner surface of said second section of tubing when said second section telescopically receives said first section,

a mechanical stop, fixedly attached against movement relative to said outer surface of said first section of tubing at a location farther from said second section than said sealing means,

a ferrule having

an inner surface arranged so that said ferrule loosely slidably engages said outer surface of said first section of tubing at a location between said sealing means and said mechanical stop,



a pivoting surface facing said mechanical stop and adapted to engage said mechanical stop so that said ferrule pivots on said mechanical stop, and

an outer tapered surface having a narrow end facing said second section of tubing for conformably, pivotally engaging said inner surface of said second section at said open end, and

coupling means mounted on one of said first and second sections of tubing and adapted to engage the other of said first and second sections to draw said first and second sections together, causing said ferrule to engage said mechanical stop and said inner surface of said second section whereby said pivoting movement is produced,

said ferrule, said inner surface of said second section at said open end, said mechanical stop, and said first section of tubing being arranged to be in an overlapping weded relation with each other when said first and second sections of tubing are drawn together by said coupling means to form said firm mechanical joint.

4,346,924

RELEASABLE FASTENING DEVICE

Leslie V. Herriott, Wolverhampton, England, assignor to Lowe and Fletcher Limited, Walsall, England

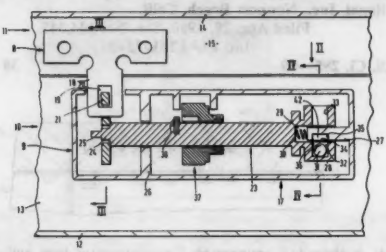
Filed Mar. 31, 1980, Ser. No. 135,696

Claims priority, application United Kingdom, Apr. 12, 1979, 7913091

Int. Cl.³ E05C *3/06*

U.S. Cl. 292—129 **2 Claims**

1. A container comprising a base, a lid hinged to the base and a fastening device, wherein the base and the lid each comprise respective peripheral walls which abut when the container is closed, the fastening device comprises first and second parts which are secured to respective ones of the base and lid, the first part of the fastening device includes a body and a further member mounted in the body for movement relative thereto between a fastening position and a releasing position, the fastening member having means for fastening the second part of the device in a predetermined position relative to the body when the fastening member is in its fastening position, the fastening device further comprises a combination lock mechanism for releasably locking the fastening member in its fastening position, the first part of the fastening device further comprises a retaining element which is engageable with the fastening member and is movable relative thereto and relative to the body under the action of gravity from a retaining position in which the retaining element retains the fastening member in its fastening position to an inactive position in which the retaining element allows the fastening member to move from its fastening position to its releasing position, there is formed in one of the fastening member and the body a first recess defined, in part, by first and second boundary surfaces, there is formed in



the other of the fastener member and body a second recess which is larger than the retaining element, said first boundary surface is perpendicular to said peripheral walls and faces towards the second recess, said second boundary surface is inclined to said first boundary surface and to said peripheral walls, said second boundary surface also faces towards the second recess, the retaining element is movable within the first and second recesses and the distance between said first boundary surface and a mouth of the second recess is less than the corresponding dimension of the retaining element.

4,346,925

HANDLE DEVICE OF LID OPENER MECHANISM

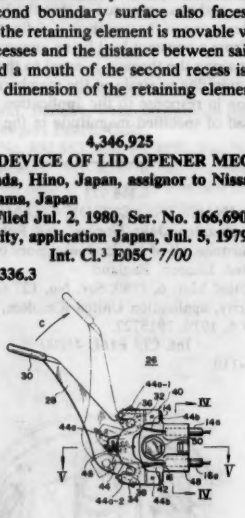
Yasumasa Okada, Hino, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 2, 1980, Ser. No. 166,690

Claims priority, application Japan, Jul. 5, 1979, 54-84441

Int. Cl.³ E05C *7/00*

U.S. Cl. 292—336.3 **10 Claims**



1. In a lid opener mechanism including two locking devices for respectively locking two lids, and two control wires respectively connected at their one ends to said two locking devices for making said locking devices inoperative when pulled in a given direction, a handle device for operating said control wires, comprising:

a supporter stationarily arranged at a position far from said two locking devices;

a single lever having one end forking into first and second work portions;

swinging means for swinging said single lever relative to said supporter;

biasing means for biasing said lever to take a predetermined neutral position; and

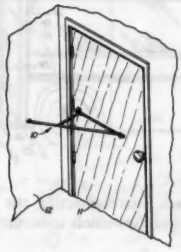
connecting means for connecting the other ends of said control wires to said first and second work portions of said lever respectively, whereby when said lever is swung in a direction against the force of the biasing means causing one of said first and second work portions to pull its corresponding control wire in the given direction, the corresponding locking device becomes inoperative thereby to unlock the corresponding lid.

4,346,926

DOOR SECURITY DEVICE

Frank E. Lucas, 121 Park Plaza Dr., Daly City, Calif. 94015

Filed Jul. 20, 1981, Ser. No. 284,418
Int. Cl.³ E05F 5/14
U.S. Cl. 292—338 9 Claims



1. A door security device for use with a door mounted transverse to an adjacent wall comprising:

an elongate stop rod having inner and outer ends, said outer end adapted to engaged the wall;

a first hinge means for pivotally mounting said inner end to said door;

an elongate spacing rod having first and second ends and attached at said first end to an intermediate position along said stop rod; and

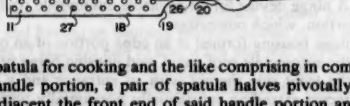
a second hinge means, horizontally aligned with said first hinge means, for pivotally mounting said second end of said spacing rod to said door, said second hinge means including means for permitting the movement of said spacing rod and stop rod therewith between a first position parallel to the door and a second position generally perpendicular to the door and also including means for preventing the movement of said stop rod past said second position.

4,346,927

ADJUSTABLE SPATULA

Walter E. Karg, 132 - 1065 Beaverhill Blvd., Winnipeg, Manitoba, Canada

Filed Oct. 3, 1980, Ser. No. 193,805
Int. Cl.³ A47J 43/28
U.S. Cl. 294—7 4 Claims



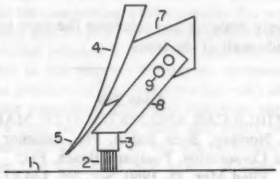
1. A spatula for cooking and the like comprising in combination a handle portion, a pair of spatula halves pivotally supported adjacent the front end of said handle portion and extending forwardly therefrom, in side by side planar relationship, actuating portions extending rearwardly from each of the spatula halves substantially parallel to said handle portion and spring means reacting between said actuating portions normally urging them apart and the spatula halves together, said handle portion including apertured retaining lips adjacent said pivotal support, said spatula halves engaging through said retaining lips, the inner edges of said actuating portions of said spatula halves diverging outwardly from one another when said spatula halves are together and a pivot pin extending upwardly from the plane of the handle portion and engaging between said spatula halves at the junction between the inner edges of said spatula halves and the inner edges of said actuating portions, said spring means normally urging and retaining said spatula halves in engagement under said retaining lips.

4,346,928

SNOW PLOW ATTACHMENT

Marvin S. Towsend, 1365 Potomac Heights Dr., Oxon Hill, Md. 20022

Continuation-in-part of Ser. No. 874,816, Feb. 3, 1978, Pat. No. 4,153,287. This application Mar. 20, 1979, Ser. No. 22,169
Int. Cl.³ E01H 5/12
U.S. Cl. 294—51 4 Claims



1. In a plow having a plow blade, a plow blade support, and a means for attaching the plow blade to a motor vehicle, the improvement, comprising:

a. a bristle support having semirigid bristles for contacting the surface to be cleared, said bristle support having a forward end with an upper surface and a rearward end, said forward end having its bristles forward of and adjacent to the leading edge of the plow blade thereby directing the moved material which is moved into the plow blade; said semirigid bristles serving the functions of brushing down and scraping down the surface and resiliently yielding to and riding over irregularities on the surface; and

b. means for positioning said bristle support adjacent to the leading edge of the plow blade.

4,346,929

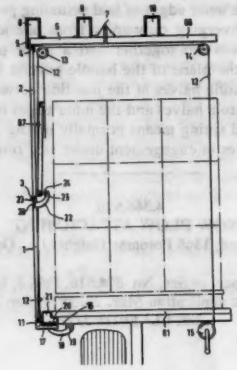
TRUCK WITH LOADING PLATFORM AND BODY

Günter Peters, Staumühle 228, 4791 Hövelhof, Fed. Rep. of Germany

Filed May 12, 1980, Ser. No. 148,946
Claims priority, application Fed. Rep. of Germany, May 16, 1979, 2919608
Int. Cl.³ B62D 27/00
U.S. Cl. 296—36 9 Claims

1. A truck having a flat-roof with a central stationary element, a loading platform, a pair of spaced end walls at opposite ends of the loading platform and a body comprising a side-wall made of two lengthwise elements that are hinged together, the side-wall element adjacent to the roof of the truck being hinged along the edge that is adjacent to the roof, an element of the roof that is hinged to said side-wall element also being moveable and, hinged to the central stationary roof element by a hinge elevated above the flat roof, a rope attached to said side-wall element that is hinged only to said roof-hinged side-wall element, which rope extends near the hinge between the side-wall element and the moveable roof element, an open guide pulley secured to the stationary end walls and for orienting the rope in a plane parallel with the stationary roof ele-

ment, a guide pulley within the truck body for leading the rope away from said central stationary roof element, and a winch



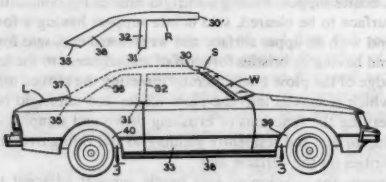
for selectively drawing and releasing the rope to open and to close the side-wall of the truck.

4,346,930

CONVERTIBLE CAR AND METHOD OF MAKING SAME

Charles R. Northey, Boca Raton, Fla., assignor to Grandeur Motorcar Corporation, Pompano Beach, Fla.

Filed Mar. 28, 1980, Ser. No. 134,877
Int. Cl.³ B60J *7/00*
U.S. Cl. 296—107 **20 Claims**



11. In a two-door passenger car having a foldable convertible top, the improvement which comprises:

reinforcing members extending inside the rocker panels of the car body along substantially their entire length between the front and rear wheel wells on each side;

reinforcing plates attached to the opposite sides of the car body on the inside just above the floor between the rear wheel wells and the respective door posts;

reinforcing plates attached to the opposite sides of the car body on the inside just above the floor immediately in front of the door opening on that side;

and a hinged operating linkage for the convertible top attached to each side of the car body.

4,346,931

BIFOLD VEHICLE DOOR ASSEMBLY

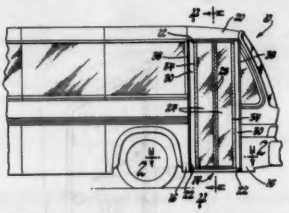
Ralph H. Merkle, Brighton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 12, 1980, Ser. No. 206,139
Int. Cl.³ B60J *5/06*
U.S. Cl. 296—148 **3 Claims**

1. In a vehicle having a body side of non-linear cross-section and a passenger access port having upper and lower walls defined by the vehicle and side walls defined by the body side, a door assembly for opening and closing the access port, comprising,

a pair of bifold doors movable between an unfolded position closing the access port and a folded position opening the access port, each door in unfolded position having an outer planar panel disposed between the upper and lower walls, each door further having a side panel having an outer planar portion located generally coplanar to a respective outer panel, an inner portion located inwardly of the body side and an intermediate arcuate portion extending between the inner and outer portions past a respective side wall,

first hinge means interconnecting each planar panel and the outer planar portion of a respective side panel,



second hinge means interconnecting the inner portion of each side panel and the vehicle to mount each bifold door on the vehicle,

means rotating the side panels about the second hinge means to move each door between the unfolded position and a folded position wherein the side panels are located inwardly of the side walls to one side thereof and the outer panels are folded inwardly of the access port and are located adjacent the side walls and the side panels,

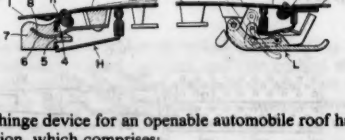
and cooperating means on each outer panel and one of the upper and lower walls for guiding movement of the planar panels as the bifold doors move between unfolded and folded positions.

4,346,932

HINGE DEVICE FOR AN OPENABLE AUTOMOBILE ROOF

Hidefumi Iwata, Koganei; Yoshimasa Tuchiya, Sayama, and Toshiharu Iidaka, Funabashi, all of Japan, assignors to Kokusan Kinzoku Kogyo Kabushiki Kaisha, Tokyo and Nissan Motor Co., Ltd., Yokohama, both of, Japan

Filed Aug. 14, 1980, Ser. No. 178,097
Claims priority, application Japan, Aug. 16, 1979, 54-103560
Int. Cl.³ B60J *7/18*
U.S. Cl. 296—216 **3 Claims**



1. A hinge device for an openable automobile roof having a lid portion, which comprises:

a hinge housing formed at an edge portion of an opening in the automobile roof panel, said housing being provided at the front side thereof with an entrance and a dead end recess extending substantially horizontally with said entrance, in facing relation to said opening;

a rigid hinge tongue attached to said lid portion and having a cross-section smaller than the recess of said housing; and

a guide portion provided in front of said entrance and having

a tapered guiding surface, for engaging said tongue, spaced apart from said entrance, and in facing relation thereto, so as to permit insertion of said tongue into the recess,

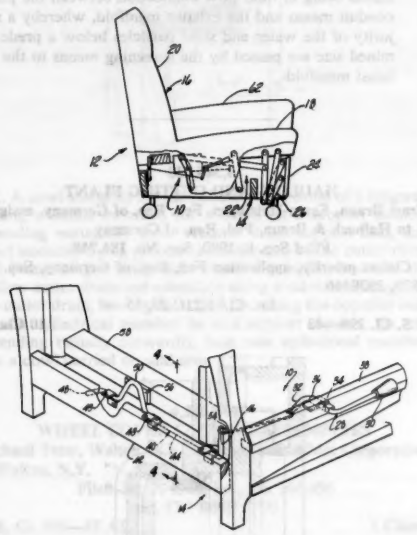
said rigid hinge tongue having an expanded portion at its free end to snugly fit into the dead-end recess, and a stopper section to slide on said tapered guiding surface when said lid portion is in a position to close said opening in the automobile roof panel.

4,346,933

RECLINING ACTUATOR FOR A RECLINER CHAIR

Ronald E. Jacobs, Georgetown, Ky., assignor to Hoover Universal, Inc., Ann Arbor, Mich.

Filed May 6, 1980, Ser. No. 147,192
Int. Cl.³ A47C *1/02*
U.S. Cl. 297—89 **10 Claims**



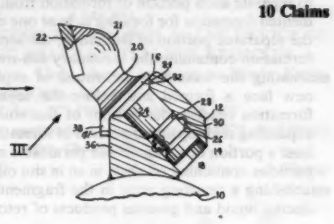
1. In a reclining chair comprising a chair frame, a seat unit, and linkage means mounting said seat unit on said chair frame for back and forth movement between a seating position and a reclining position located forwardly of said seating position, an actuator assembly mounted on said chair frame and operable when actuated to move said seat unit from said seating position toward said reclining position, said actuator assembly comprising a handle mounted on said chair frame movable between an idle position and an operative position, an activator member mounted on said chair frame for movement between a rest position and an activated position, link means connecting said handle with said activator member for transmitting the movement of said handle from said idle position toward said operative position to said activator member to move said activator member from said rest position to said activated position, said activator member being in a non-connected relation with said seat unit and having an abutting portion located in the part of movement of said seat unit so that when said seat unit is in said seating position, movement of said activator member from said rest position toward said activated position in response to movement of said handle from said idle position toward said operative position causes said abutting portion to abut said seat unit and apply a forwardly directed force to said seat unit operable to move said seat unit from said seating position toward said reclining position.

4,346,934

EXCAVATING BIT

Michael A. College, Everett, and Robert J. McKeary, Windber, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Continuation of Ser. No. 811,181, Jun. 29, 1977, abandoned.
This application Feb. 5, 1979, Ser. No. 9,710
Int. Cl.³ E21C *35/18*
U.S. Cl. 299—92 **10 Claims**



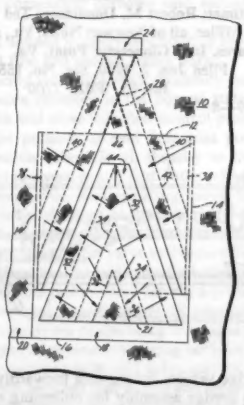
1. A nonrotatable excavating bit, designed for mounting in a support block having a bore in one face and a smooth exterior face which is angularly related to, but not perpendicular to, the bore axis, said bit comprising a substantially flat working portion on one end and a cylindrical shank portion on the other; said shank portion adapted to be received in said bore so as to retain said bit in the support block; an abutment shoulder formed by the juncture of said shank portion with said working portion; a tang extending from said abutment shoulder; said tang having a tang face which faces said shank portion; said tang face is angularly related to, but not perpendicular to, the shank portion axis; said tang face in and of itself sufficiently defining a means for mating with said smooth exterior face of said support block and holding said bit nonrotatable in the support block.

4,346,935

METHOD FOR FRAGMENTING OIL SHALE FORMATION

Wilhelmus G. J. Huijnen, Gouda, Netherlands, assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Nov. 17, 1980, Ser. No. 207,480
Int. Cl.³ E21C *41/10*
U.S. Cl. 299—2 **29 Claims**



1. A method for recovering liquid and gaseous products from an in situ oil shale retort formed in an in situ retort site in a subterranean formation containing oil shale, the in situ retort containing a fragmented permeable mass of formation particles containing oil shale, the method comprising the steps of:

forming a void in a lower portion of the retort site;

placing a primary sub-round of explosive in a portion of un-

fragmented formation within the retort site above the void, said primary sub-round defining a boundary of said portion of unfragmented formation;

placing a secondary sub-round of explosive in said portion of unfragmented formation;

detonating the primary sub-round of explosive for fracturing such unfragmented formation generally along said boundary to separate such portion of formation from adjacent unfragmented formation for forming at least one new face adjacent the separated portion of formation, the separated portion of formation containing the secondary sub-round of explosive;

detonating the secondary sub-round of explosive after such new face is formed and before the separated portion of formation reaches the bottom of the void for explosively expanding said separated portion of formation for forming at least a portion of a fragmented permeable mass of formation particles containing oil shale in an in situ oil shale retort; and

establishing a retorting zone in the fragmented mass for producing liquid and gaseous products of retorting.

4,346,936

TREATMENT OF SUBTERRANEAN URANIUM-BEARING FORMATIONS

Tsoung-Yuan Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 19, 1980, Ser. No. 179,549
Int. Cl.³ E21B *43/28*
U.S. Cl. 299—4 **11 Claims**

10. In the process for in situ leaching of mineral values from a mineral-bearing subterranean formation comprising pumping an oxidant-containing lixiviant under pressure into the formation through one or more injection wells, allowing the lixiviant to leach out the mineral values in the formation, and removing from said formation the lixiviant pregnant with the mineral values through one or more production wells spaced from said injection wells, the improvement comprising:

(a) prior to injecting the lixiviant into the formation, pumping oxidant into the formation until said oxidant has broken through at the production wells, and

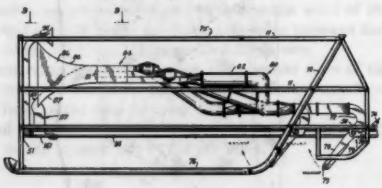
(b) shutting in the production wells to permit oxidation of the formation.

4,346,937

DREDGING APPARATUS INCLUDING SUCTION NOZZLES

John P. Latimer; Robert M. Donaldson; Ted W. Christian, and Glenn E. Miller, all of Newport News, Va., assignors to Deepsea Ventures, Inc., Gloucester Point, Va.

Filed Jun. 2, 1980, Ser. No. 155,316
Int. Cl.³ E02F *7/00*
U.S. Cl. 299—8 **22 Claims**



1. A dredge vehicle for moving forwardly along the ocean floor and a dredge assembly for collecting solid ore particles from the ocean floor and delivering the ore particles to an elevator means, the dredging assembly comprising:

collection means to collect solid particles from the ocean floor mixed with a relatively large quantity of water, the collection means extending transversely across a forward portion of the dredge vehicle;

pumping means in series fluid flow connection with the collection means, and so designed that during operation a flow comprising a suspension of solid ore particles with a relatively large quantity of water is accelerated from the collection means through the pumping means;

pump conduit means having a first end and a second end, the first end being in fluid flow connection with the pumping means;

ore particle screening means in fluid flow connection with the second end of the pump conduit means to separate solid particles from at least a portion of the water in the pump conduit means;

elevator feed conduit means in fluid flow connection with the second end of the pump conduit means and designed to feed solid particles not passed by the screening means to an elevator means leading to the ocean surface; and

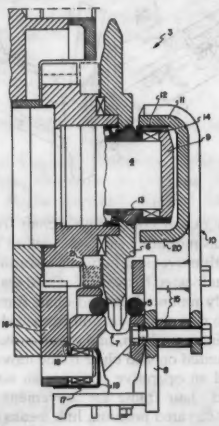
a manifold in fluid flow connection with the pump conduit means, the manifold comprising an elevator feed manifold conduit and an exhaust manifold conduit, the screening means being in fluid flow connection between the pump conduit means and the exhaust manifold, whereby a majority of the water and solid particles below a predetermined size are passed by the screening means to the exhaust manifold.

4,346,938

HAULING AND CUTTING PLANT

Ernst Braun, Essen-Heisingen, Fed. Rep. of Germany, assignor to Halbach & Braun, Fed. Rep. of Germany

Filed Sep. 8, 1980, Ser. No. 184,748
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1979, 2938446
Int. Cl.³ E21C *29/16*
U.S. Cl. 299—43 **10 Claims**



1. An improved hauling and cutting assembly of the type having a conveyor trough, a scraper chain conveyor bridging the conveyor trough, a bearing pin mounted on the conveyor, a sprocket wheel arranged on the bearing pin, a base frame connected to the conveyor trough having a portion with a guide slot longitudinally extending in the conveying direction, and a drive chain engaging the sprocket wheel extending within the guide slot, wherein the improvement comprises a roller member radially mounted for rotation at the end of the bearing pin, and guide means connected to the base frame overlapping said roller member for radially supporting said roller member.

4,346,939

COWL ASSEMBLY FOR LONGWALL MINING MACHINE

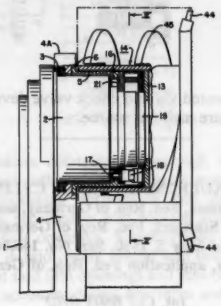
Rolf Krause, Essen, Fed. Rep. of Germany, assignor to Gerb. Eickhoff Machinenfabrik und Eisengiesserei m.b.H., Bochum, Fed. Rep. of Germany

Filed Oct. 7, 1980, Ser. No. 195,245

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1979, 2941921

Int. Cl.³ E21C 35/20

U.S. Cl. 299—45 7 Claims



1. A cowl assembly for the hollow cutter drum of a longwall mining machine mounted for rotation on a support element extending outwardly from a cutter drum support arm, said cowl assembly being pivotal about the axis of the cutter drum and comprising a cylindrical member positioned within the hollow cutter drum and extending along a substantial length of the cutter drum, bearing means for mounting the opposite ends of said cylindrical member on said support element, an arm extending radially outwardly from said cylindrical member, and a cowl carried on said arm.

4,346,940

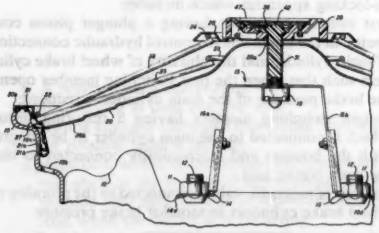
WHEEL COVER LOCKING ASSEMBLIES

Richard Tatar, Walton, N.Y., assignor to Del-Met Corporation, Walton, N.Y.

Filed Jul. 7, 1980, Ser. No. 166,056

Int. Cl.³ B60B 7/00

U.S. Cl. 301—37 AT 5 Claims



3. A locking assembly for locking a wheel cover on a vehicle wheel which is secured to a vehicle by a plurality of lug nuts for rotation of said wheel about an axis, comprising, in combination: a mounting bracket adapted to be secured under a pair of said lug nuts and to locate a threaded nut axially outwardly from said wheel on said axis; a rotatable knob member adapted to seat against a central portion of said wheel cover surrounding said axis; a threaded bolt means journalled in said knob member for rotation about said axis and adapted to threadedly engage said threaded nut; and a cam seated within said rotatable knob member, said cam being pivotable between a first position at which rotation of said knob member causes rotation of said bolt means and a second position at which rotation of said knob member does not cause rotation of said bolt means, said cam comprising a disc pivotable about a pivot axis displaced from and substantially parallel to said axis of rotation of said wheel.

4,346,941

HYDRAULIC PRESSURE CONTROL VALVE DEVICE OF HYDRAULIC BRAKE SYSTEM FOR VEHICLES

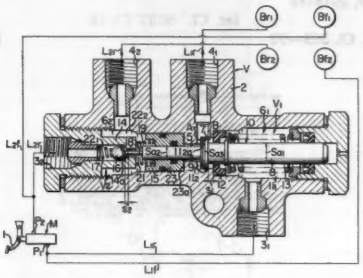
Mitutoyo Mizusawa, Ueda, Japan, assignor to Nissin Kogyo Kabushiki Kaisha, Ueda, Japan

Filed Aug. 27, 1980, Ser. No. 181,845

Claims priority, application Japan, Aug. 30, 1979, 54-110630

Int. Cl.³ B60T 8/26

U.S. Cl. 303—6 C 5 Claims



1. A hydraulic pressure control valve device of hydraulic brake system for vehicles comprising:

a valve housing having a first inlet port and a second inlet port communicating with a first outlet port and a second output port of a master cylinder, respectively, a first outlet port and a second outlet port communicating with a left rear wheel brake and a right rear wheel brake of the vehicle, respectively;

a first control pressure chamber defined in said valve housing for connection between said first inlet and outlet ports;

a second control pressure chamber defined in said valve housing for connection between said second inlet and outlet ports;

a cylinder bore defined in said valve housing for connection between said first and second outlet ports;

a pressure reducing valve adapted to normally open said first control pressure chamber in the normal state and to repeatedly open and close said first control pressure chamber when the pressure at said first inlet port is raised beyond a predetermined level, thereby to transmit said first inlet port pressure to said first outlet port at a proportionally reduced rate, said reducing valve including an input oil pressure chamber communicating with said first inlet port, an output oil pressure chamber communicating with said first outlet port, a valve seat separating said input oil pressure chamber and said output oil pressure chamber from each other, a piston valve having a pressure receiving piston disposed in said output oil pressure chamber, said pressure receiving piston being formed at its opposite sides with a pair of pressure-receiving surfaces of different areas and cooperating with said valve seat for controlling communication between said output and input oil pressure chambers, and a spring means for biasing said piston valve in the opening direction relative to said valve seat;

a cut-off valve adapted to normally open said second control pressure chamber in the normal state and so associated with said pressure reducing valve as to close said second control pressure chamber immediately upon or before the closing of said pressure reducing valve; and

a balance piston slidable in said cylinder bore and adapted to move, when the pressure at said first outlet port is higher than the pressure at said second outlet port, in the direction to achieve an equilibrium of these pressures;

the improvement comprising a valve rod integrally connected to said pressure receiving piston and projecting into said second control pressure chamber to act directly on said cut-off valve for opening and closing thereof.

4,346,942

HYDRAULIC BRAKE FORCE AMPLIFIER

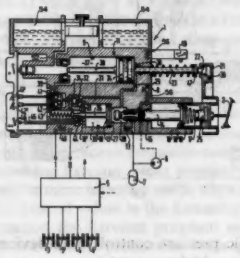
Heinz Leiber, Leimen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 20, 1980, Ser. No. 132,346

Claims priority, application Fed. Rep. of Germany, May 10, 1979, 2918785

Int. Cl.³ B60T *17/18*

U.S. Cl. 303—92 **8 Claims**



1. A hydraulic brake force amplifier for multiple-circuit brake systems, arranged to be actuated by a brake pedal via a travel-limiting spring and further provided with a control valve, said control valve adapted to control both a connection of a source of pressure medium with a main cylinder and a connection of the main cylinder with a relief location, said control valve further being disposed parallel to said main cylinder and connected therewith via a force transmitting device which cooperates with an arresting piston member, said arresting piston member arranged to limit the stroke of said control valve and capable of being switched off if the pressure supply fails, characterized in that said arresting piston member cooperates with means which permit its use as a second main cylinder upon pressure failure in said brake system.

4,346,943

ANTI-LOCKING APPARATUS

Heinz Leiber, Leimen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

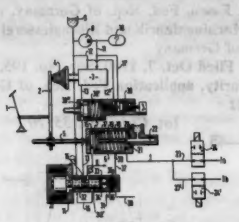
Filed Mar. 20, 1980, Ser. No. 132,057

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1979, 2915821

Int. Cl.³ B60T *8/04*

U.S. Cl. 303—119 **16 Claims**

1. A hydraulic main cylinder including a primary side, a secondary side, and an anti-locking apparatus for a hydraulic brake system including a valve pedal push rod, a foot-actuated brake control valve, a travel-limiting spring secured on said brake control valve, and a pressure source, whereby at least one pressure medium proceeds from said pressure source to the primary side of said hydraulic main cylinder, said hydraulic main cylinder arranged to supply closed brake circuits and further including a check valve device, one 3/2-way switching valve and at least one 2/2-way valve for the purpose of anti-locking pressure modulation, characterized in that said brake



circuits are connected via said check valve device with a relief side of the pressure medium source.

4,346,944

HYDRAULIC MAIN BRAKE CYLINDER

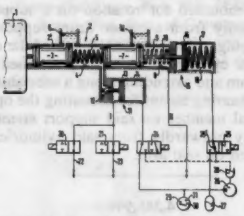
Heinz Leiber, Leimen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 5, 1980, Ser. No. 146,862

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1979, 2925478

Int. Cl.³ B60T *8/02*

U.S. Cl. 303—119 **7 Claims**



1. A multiple brake system including:

a hydraulic main cylinder to provide brake pressure having a main piston and a housing,

a plurality of wheel brake cylinders;

a brake line for hydraulic connection of the main cylinder and the plurality of wheel brake cylinders; and

an anti-locking apparatus which includes;

a first switching member having a plunger piston connected in the brake line to control hydraulic connection of main cylinder and the plurality of wheel brake cylinders such that when the first switching member opens, the brake pressure of the main cylinder is reduced;

a second switching member having a restoring piston which is connected to the main cylinder to be integral with the housing and mechanically connected to bias the main piston; and

a plurality of magnetic valves connected to the plurality of wheel brake cylinders to monitor brake pressure

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4,346,945

MULTIPURPOSE RECIPROCAL BEARING UNIT

Nobuyuki Tsuboi, 2-1, Okayama 5-Chome, Shijonawate City, Osaka, Japan (575)

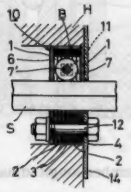
Filed Sep. 26, 1980, Ser. No. 191,645

Int. Cl.³ F16C *29/04*

U.S. Cl. 308—6 R **13 Claims**

1. A reciprocal bearing device to be provided between a shaft member and a support member, comprising a plurality of substantially thin members layered in an axial direction of said shaft member in a manner to form a casing, said thin members

having a central aperture and a plurality of securement-receiving openings disposed about said central aperture, a plurality of some of said thin members also having a plurality of first openings disposed about said central aperture, said first openings having a roller accommodating portion and a bearing accommodating portion, a plurality of other of said thin members having a plurality of roller accommodating apertures, a plurality of roller means mounted in said casing, said roller means



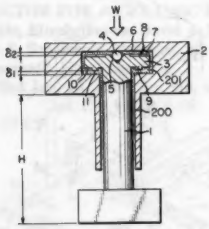
comprising rollers rotatable in bearings, said rollers being received in said roller accommodating apertures and in said roller accommodating portions of said first openings, said bearings being received in said bearing accommodating portions of said first openings, whereby said bearings are fixed non-rotatably in said casing within said bearing accommodating portions of said first openings and said rollers are rotatably in said roller accommodating apertures and in said roller accommodating portions of said first openings.

4,346,946

ROTARY DEVICE

Teruo Maruyama, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 23, 1980, Ser. No. 171,375
Claims priority, application Japan, Jul. 26, 1979, 54-95366
Int. Cl.³ F16C *32/06*
U.S. Cl. 308—9 **4 Claims**



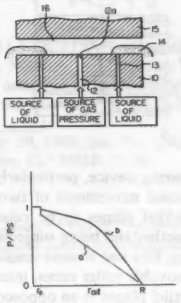
1. A rotary device comprising:
a shaft having at least one free end;
a housing engaged through a lubricating fluid with said shaft for rotation relative thereto;
a projection, which extends from a surface of said free end of said shaft or the surface of said housing in opposed relationship with said free end of said shaft, to carry the axial load when the device is not rotating;
a first dynamic thrust bearing which acts in such a way that the free end of said shaft and the surface of said housing, in opposed relationship with said free end of said shaft are forced to be separated in the axial direction when the device is rotated; and
a second dynamic thrust bearing which acts to produce a force which conteracts the axially acting force produced by said first dynamic thrust bearing, said second dynamic thrust bearing being formed in a relatively moving surface different from said surface with said projection and said surface in opposed relation thereto, said second dynamic thrust bearing having a greater change in load carrying capacity with displacement in the axial direction, than said first dynamic thrust bearing, at the point at which said first and second dynamic thrust bearings are in equilibrium.

4,346,947

HYDROSTATIC PRESSURE GAS-LIQUID DOUBLE PHASE BEARING

Tsunamitsu Nakahara, No. 10-19, 3-chome, Denenchofu, Ota-ku, Tokyo; Hiroshi Aoki, No. 11-6, 1-chome, Minami-Senzoku, Ota-ku, Tokyo, both of Japan, and Toru Kurisu, Tokyo, Japan, assignors to Citizen Watch Company Limited; Tsunamitsu Nakahara and Hiroshi Aoki, all of Tokyo, Japan

Filed Aug. 13, 1980, Ser. No. 177,537
Int. Cl.³ F16C *32/06*
U.S. Cl. 308—9 **9 Claims**



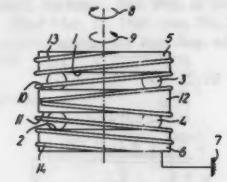
1. A hydrostatic pressure bearing for a rotor having a bearing surface, comprising:
a stationary body having a bearing surface and spaced from the bearing surface of said rotor by a predetermined clearance;
a central gas passageway formed in a central part of said stationary body and communicating with a source of gas under pressure, said gas passageway opening to said clearance to form a gas film therebetween; and
liquid passageway means circumferentially formed in said stationary body around said central gas passageway and communicating with a source liquid, said liquid passageway means opening to said clearance to provide a thin liquid film which is adhered to the bearing surface of said stationary body in a circle shape during rotation of said rotor;
whereby said gas under pressure flows between said thin liquid film and the bearing surface of said rotor to rotatably support said rotor.

8. A hydrostatic pressure bearing for a shaft having an outer bearing surface, comprising:
a cylindrical body having an inner bearing surface and spaced from the bearing surface of said shaft by a predetermined clearance;
central gas passageway means formed in a central part of said cylindrical body and communicating with a source of gas under pressure, said gas passageway opening to said clearance to form a gas film therebetween; and
first and second liquid passageway means formed in said cylindrical body on both sides of said central gas passageway means and communicating with a source liquid, said liquid passageway means opening to said clearance to provide first and second thin liquid films which are adhered to the bearing surface of said cylindrical body during rotation of said shaft;
whereby said gas under pressure flows between said thin liquid films and the bearing surface of said rotor to rotatably support said shaft.

4,346,948
THRUST BEARING DEVICE, PARTICULARLY FOR TAKING UP OSCILLATING ROTATIONAL MOVEMENTS

Svend H. Kristiansen, Naestved, Denmark, assignor to Nordisk Ventilator Co., A/S, Naestved, Denmark

PCT No. PCT/DK80/00003, § 371 Date Sep. 19, 1980, § 102(e) Date Sep. 12, 1980, PCT Pub. No. WO80/01503, PCT Pub. Date Jul. 24, 1980
PCT Filed Jan. 9, 1980, Ser. No. 205,369
Claims priority, application Denmark, Jan. 19, 1979, 251/79
Int. Cl.³ F16C *19/10, 19/50*
U.S. Cl. 308—219 11 Claims



1. A thrust bearing device, particularly for taking up small oscillating rotational movements of two coaxial roller races extending in parallel planes to be relatively movable with respect to one another and being subjected to an axial loading force, comprising; first and second coaxial race rings forming said relatively movable roller races, intermediate roller races extending in parallel planes in an opposed relationship to each of said relatively movable races to provide two coaxial thrust bearings coupled in series with respect to said loading force, coupling means firmly connecting said intermediate races, a set of roller members arranged between each of said relatively movable races and the opposed intermediate race, and blocking means acting on said coupling means and each of said first and second race rings to prevent relative rotational movement between one of the relatively movable races and its opposed intermediate race for one direction of revolution and between the other of the relatively movable races and its opposed intermediate race for the other direction of revolution, said blocking means comprising clamping means arranged laterally with respect to said coupling means and each of said first and second race rings, respectively, to exert a pressure transverse to the common axis of said coaxial bearings and firmly clamp said coupling means with respect to said first race ring for said one direction of revolution and with respect to said second race ring for said other direction of revolution.

4,346,949
ROTOR ASSEMBLY PROVIDED WITH A BEARING HAVING VIRTUALLY ZERO AXIAL CLEARANCE

Jean-Francois Beau, Saint-Ouen L'Aumone, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Mar. 6, 1980, Ser. No. 127,833
Claims priority, application France, Mar. 20, 1979, 79 07022
Int. Cl.³ H03K *5/22*
U.S. Cl. 308—236 3 Claims

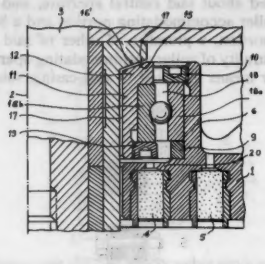
1. A rotor assembly comprising:

a rotor adapted for rotation about a shaft;

a bearing comprising inner and outer races concentric with said rotor and rolling members disposed to roll between said races;

one of said races being secured to said rotor and the other thereof being secured to a rotatable annular member concentric with said rotor, said rotor and said annular member being longitudinally relatively displaceable to the extent of the axial clearance of said bearing;

magnetic means secured to each of said rotor and said annular member, which means cooperate to maintain said rotor

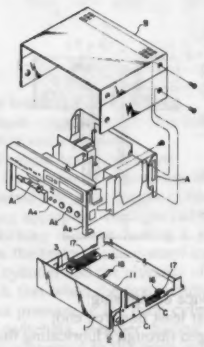


and said annular member longitudinally displaced by said axial clearance.

4,346,950
DOOR CONSTRUCTION FOR ELECTRONIC EQUIPMENT

Hitoshi Ueno; Shirokazu Yazaki, and Yukitada Ayukawa, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 18, 1980, Ser. No. 170,229
Claims priority, application Japan, Jul. 20, 1979, 54-92238
Int. Cl.³ A47B *88/00;* A47F *3/00;* E05D *15/58*
U.S. Cl. 312—138 R 9 Claims



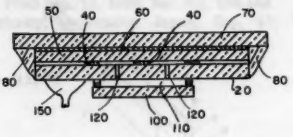
1. A door construction for covering control knobs upon the front panel of electronic equipment comprising: a door member; means for forming a pair of guide grooves one on each side of said door member, each of said guide grooves having a linear guide groove extending longitudinally and an enlarged circular guide groove at a forward portion of said linear grooves; first and second hinge members attached to said door member on opposite sides thereof; first and second guide rollers rotatably mounted upon corresponding ones of said first and second hinge members, each of said guide rollers having a substantially oblong portion and a coaxial cylindrical portion, said door being movable only horizontally when said oblong portions are engaged with said linear grooves and said door being only rotatable when said circular portions are engaged with said enlarged circular grooves.

4,346,951

METHOD FOR PROVIDING A GAS RESERVOIR FOR A GAS DISPLAY PANEL

Bernard Caras, Princeton, and Robert E. Kollmyer, Bridgewater, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 19, 1980, Ser. No. 161,155
Int. Cl.³ H01J 9/18
U.S. Cl. 316—19 3 Claims



1. The method of making a display panel comprising the steps of

loosely assembling a glass base plate and a glass face plate with a sealing frit to form the panel envelope,

seating an auxiliary glass plate on the outer surface of said base plate with a sealing frit between them,

placing a plurality of metal clamps along the perimeter of the envelope formed by the base plate and face plate while leaving the central portions of the base plate and face plate open to the atmosphere,

placing metal weights at the ends of said auxiliary glass plate but leaving the center thereof exposed to the atmosphere, and

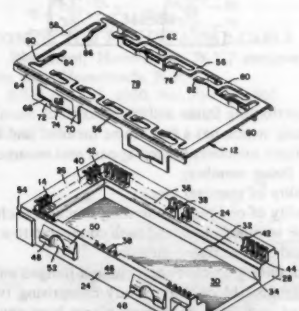
applying heat to cause the base plate and face plate to become sealed together and to cause the auxiliary plate to become sealed to said base plate, the entire panel undergoing substantially uniform temperature change due to the presence of said metal clamps and said metal weights.

4,346,952

CONNECTOR FOR A CERAMIC SUBSTRATE

Edward J. Bright, Elizabethtown; David A. Kaplon, Harrisburg, and William S. Scheingold, Palmyra, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 16, 1980, Ser. No. 159,429
Int. Cl.³ H01R 9/09
U.S. Cl. 339—17 CF 2 Claims



1. An electrical connector for removably mounting a substrate to a printed circuit board with the substrate being of the type having one end adapted to receive thereon a test or card edge connector, said electrical connector comprising:

a. an elongated housing having an open top and an open end through which one end of a substrate may extend and with the side walls, floor and other end wall defining a substrate-receiving cavity, and vertical cells spaced along the inside surfaces of at least the two opposing side walls and further bores extending downwardly through the housing floor from the cells;

b. a plurality of spring members positioned in the cells with a lower end extending through the bores for insertion into a circuit board and an upper end bent back around to form a U-shape with the free end thereof being bent to project laterally into the cavity to provide a contact arm, said spring members being outwardly curved between the upper and lower ends with the amount of curvature being a radius of from about one inch to about two and one-half inches; and

c. a hold down frame having biasing means thereon and removably attached to the housing for biasing a substrate which may be positioned in the cavity against the laterally projecting contact arms.

4,346,953

ANTENNA COUPLING ASSEMBLY

Luason L. Carnaghan, Norwich, and Raymond J. Phillips, Oakdale, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 10, 1980, Ser. No. 139,072
Int. Cl.³ H01R 11/00
U.S. Cl. 339—28 3 Claims

1. A flexible adapter assembly for coupling a pair of flexible electrical connectors comprising:

an adapter at each end, with each adapter having a collar with inner threads and an extension sleeve with barbed type annular rings, said each adapter having an aperture through its axis;

a pair of cylindrical pieces with each of said pair respectively inserted in the aperture of said each adapter, said cylindrical pieces having a flange abutting respective sleeves of each adapter;

a pair of spring supports with each of said spring supports having one end abutting respective cylindrical pieces;

a spring abutting and coiled around each of said spring supports; and

a watertight sleeve enclosing said adapter extension sleeves, said cylindrical pieces, said spring supports and said spring.

4,346,954

CONNECTOR FOR ELONGATED UNDERWATER TOWED ARRAY

James Appling, Canoga Park, Calif., assignor to The Bendix Corporation, Sylmar, Calif.

Filed Apr. 7, 1980, Ser. No. 137,934
Int. Cl.³ H01R 13/62
U.S. Cl. 339—89 M 6 Claims

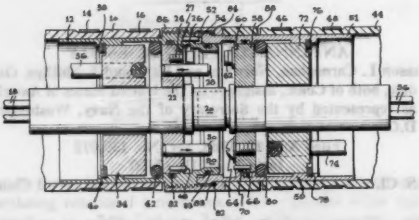
1. A connector assembly for electrically and mechanically connecting two elongated sonar arrays, each array including a length of flexible hose, electrical wiring, and hydrocarbon dielectric material in said hose, said arrays being adapted to be towed through the water at substantial depths, said connector assembly including telescoping male and female connector sections;

characterized in that each of said connector sections includes an elongated cylindrical extension to which said flexible hose is clamped, and first and second internal flanges and a groove adjacent each of said flanges, one of said connector sections including a large diameter portion carrying external threads and the other of said connector

sections having an outwardly directed flange at its end opposite said cylindrical extension,

lightweight bulkhead members each having a centrally located port positioned in each of said connector sections and means securing said bulkhead members to each of said first internal flanges, oppositely directed check valves in one of said bulkhead members effective to limit the pressure drop across said bulkhead member, a fill port in the other of said bulkhead members and means for opening and closing said port,

strength member supports positioned in each of said connector members in contact with each of said second internal flanges and retainer rings in said grooves adjacent said second internal flanges to prevent axial movement of said strength member supports,



a plurality of high strength rope members attached to each of said strength member supports which, when under load, tend to pull said strength member supports against said retainer rings,

mating electrical connector halves positioned in each of said centrally located ports,

flexible spacer means positioned between said bulkhead members and said strength member supports in each of said connector sections,

a collar having internal threads and an internally directed flange carried on said other connector member adjacent said outwardly directed flange and a shear ring positioned between said internally directed flange and said outwardly directed flange such that when said collar is threadedly engaged with said one connector section, said outwardly and inwardly directed flanges are pulled together against said shear ring.

4,346,955

SELF-STRIPPING TERMINAL FOR AN ELECTRICAL CONNECTOR

Andre Chesnais, Choisy Le-Roi, and Philippe Thiery, La Celle St. Cloud, both of France, assignors to Souriau & Cie, Boulogne-Billancourt and Socapex, Suresnes, both of, France

Continuation of Ser. No. 972,374, Dec. 22, 1978. This application Feb. 1, 1980, Ser. No. 117,485

Claims priority, application France, Dec. 28, 1977, 77 39420; May 23, 1979, 79 13188

Int. Cl.³ H01K *11/20*

U.S. Cl. 339—97 R **16 Claims**

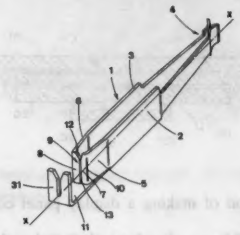
1. In a self-stripping terminal of the type wherein an electrical conductor simultaneously is stripped of its insulation and received in a slot defined between first and second opposed limbs of a forked member carried on a support structure, the conductor being supported in said terminal with its elongated central axis parallel to the longitudinal axis of said terminal, said limbs being substantially perpendicular to said longitudinal axis, the improvement comprising:

a first cantilever supported resilient arm supporting, with its free end said first limb with respect to said second limb;

said arm being substantially parallel to said longitudinal axis and substantially flexible in a plane parallel to said longitudinal axis;

said slot having first and second slot walls defined on said first and second limbs respectively, said first and second slot walls being substantially parallel to each other and to said terminal longitudinal axis to restrain degradation of the conductor core when the conductor is received therebetween;

said forked member further comprising first and second mouth walls defined on said first and second limbs respectively, said first and second mouth walls being disposed at



an outwardly opening angle with respect to each other, extending from said slot, to form a tapered guide mouth for stripping and guiding conductors into said slot, said first and second mouth walls being substantially parallel to said terminal longitudinal axis to restrain degradation of the conductor core when the conductor is moved therebetween.

4,346,956

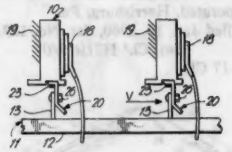
DISTRIBUTING FRAME AND TERMINAL BLOCK MEMBER ASSEMBLIES

Louis Suffi, Westchester, Ill., assignor to Northern Telecom, Inc., Nashville, Tenn.

Filed Apr. 17, 1980, Ser. No. 141,260

Int. Cl.³ H01R *13/60*

U.S. Cl. 339—119 R **3 Claims**



1. A distributing frame and terminal block member comprising: a frame which has a first frame member and a plurality of second frame members spaced appart and secured in a row to said first frame member;

a plurality of terminal blocks;

a plurality of one-piece mounting brackets each mounting a single terminal block and each connected to a separate one of said second frame members;

each mounting bracket comprising a flanged end secured to its terminal block and a body comprising two interconnected parts lying in different planes from one another, the body being formed with a slot extending from one to the other of the body parts and being mountable upon the second frame member by a screw passing through the slot into the second frame member, the bracket being movable upon the second frame member to slide the slot along the screw, when the screw is loosened, to move the screw from end to end of the slot and change the angle of orientation of the bracket relative to the second frame member, by virtue of the body parts lying in their different planes, and thus change the orientation of the associated terminal

block independent of the orientation to all other terminal blocks in said row.

4,346,957

ELECTRIC CONNECTOR

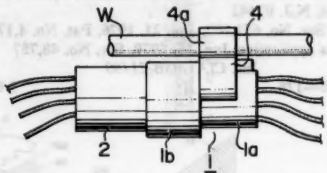
Yasuyosi Fukao, Toyota, and Hisaki Mayumi, Tsu, both of Japan, assignors to Tokai Electric Wire Company Limited, Yokkaichi and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Sep. 12, 1980, Ser. No. 186,448

Claims priority, application Japan, Sep. 13, 1979, 54-127732[U]

Int. Cl.³ H01R *13/60*

U.S. Cl. 339—119 R 3 Claims



1. An electric connector comprising: a connector housing having a generally cylindrical form, a supporting arm projecting from the outer peripheral surface of the wall of said connector housing, a clamping tab integral with said supporting arm, said supporting arm and said clamping tab as a unit being cantilevered by the wall of said connector housing in such a manner that said clamping tab extends over a certain portion of the circumference of said connector housing at a suitable distance from the latter, said clamping tab being provided at its surface facing said connector housing with a wire receiving recess formed at a portion near the free end thereof, and at least two parallel protrusions formed on the outer peripheral portion of said wall of said connector housing at a portion of the latter confronting said wire receiving recess and extending in an axial direction of said connector housing, said clamping tab resiliently clamping the wire or the like rod-like member between said wire receiving recess and said protrusions.

4,346,958

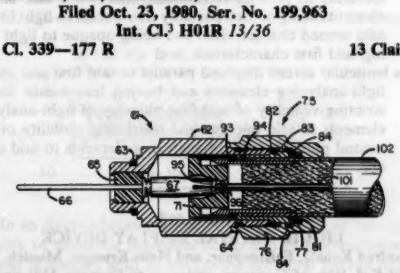
CONNECTOR FOR CO-AXIAL CABLE

Clayton H. Blanchard, Horseheads, N.Y., assignor to LRC Electronics, Inc., Horseheads, N.Y.

Filed Oct. 23, 1980, Ser. No. 199,963

Int. Cl.³ H01R *13/36*

U.S. Cl. 339—177 R 13 Claims



1. A connector for co-axial cable, the cable having a substantially rigid electrically conductive jacket, a center conductor, and electrical insulating means therebetween, said connector comprising:

an entry barrel assembly comprising:

an entry barrel having at least one open end;

electrically conductive chuck means within said entry barrel and opening toward said open end;

cylindrical mandrel means fixed in said entry barrel and extending outwardly from said open end thereof;

pusher means loosely engaging said mandrel means and axially movable with respect thereto;

electrically insulative collar means positioned between said chuck means and said pusher means and longitudinally movable in said entry barrel; and

cooperative means on said chuck means and on said collar for closing said chuck means upon engagement of said chuck means by said collar means pursuant to axial motion of said collar means toward said chuck means;

a clamp nut assembly comprising:

a clamp nut having a substantially open ended cylindrical configuration; and

a ferrule mounted within said clamp nut; and

cooperative means on said entry barrel assembly and said clamp nut assembly to grip the jacket of said cable;

whereby upon engagement of said entry barrel and clamp nut assemblies, said cooperative chuck closing means closes on the center conductor and said cooperative jacket gripping means grips the cable jacket.

4,346,959

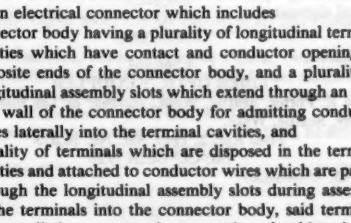
PULL-TO-SEAT ELECTRICAL CONNECTOR

James D. Daugherty, Brookfield; Joseph H. Gladd, Cortland, both of Ohio, and John M. Chupak, West Middlesex, Pa., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 10, 1980, Ser. No. 205,424

Int. Cl.³ H01R *4/24*

U.S. Cl. 339—217 S 3 Claims



1. In an electrical connector which includes

a connector body having a plurality of longitudinal terminal cavities which have contact and conductor openings at opposite ends of the connector body, and a plurality of longitudinal assembly slots which extend through an exterior wall of the connector body for admitting conductor wires laterally into the terminal cavities, and

a plurality of terminals which are disposed in the terminal cavities and attached to conductor wires which are passed through the longitudinal assembly slots during assembly of the terminals into the connector body, said terminals being pulled to seat against retention shoulders in the terminal cavities which face the contact openings to retain the terminals in the direction toward the conductor openings,

the improvement comprising;

said terminal cavities having second retention shoulders which are adjacent the longitudinal slots and face the conductor openings,

said terminals having projecting tabs disposed in the longitudinal slots for orienting the terminals in the cavities and latch fingers engaging the second retention shoulders to retain the terminals in the direction toward the contact openings, and

said latch fingers being accessible via the longitudinal slots for releasing them from the second retention shoulders so that the terminals may be individually removed from the terminal cavities through the contact openings.

4,346,960
BINOCULAR TELESCOPE HAVING A DOUBLE-JOINT CONNECTING BRIDGE

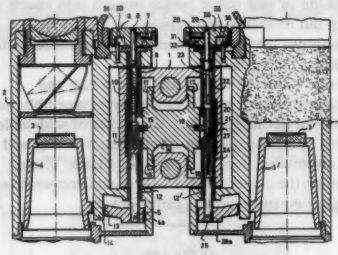
Willi Lehrmund, Leun, and Erwin Altenheiner, Waldsolms, both of Fed. Rep. of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Dec. 1, 1980, Ser. No. 211,654

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1979, 2948421

Int. Cl.³ G02B 7/06

U.S. Cl. 350—76 **7 Claims**



4. A binocular telescope comprising first and second individual telescope housings each having an offset hinge arm, and a bridge having pivotal connection on spaced parallel axes to the respective hinge arms of said housings, each of said housings containing an internal axially displaceable focusing optical element; a first single manually accessible control element and associated motion-transmitting structure traversing said bridge and foldable on said parallel axes for transmitting identical axial displacements to said internal optical elements, there being an axially fixed connection between said structure and one of said focusing optical elements and an axially variable connection between said structure and the other of said focusing optical elements, and a second single manually accessible control element and associated motion-transmitting structure including means associated with said axially variable connection for selectively varying the axial position of the other of said focusing optical elements to the exclusion of said one optical element.

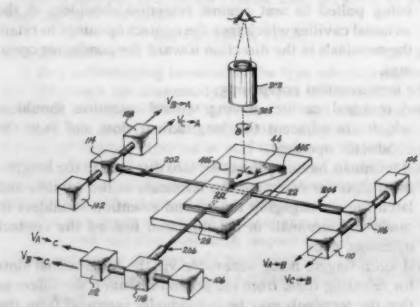
4,346,961
FIBER OPTIC T COUPLER

David R. Porter, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 2, 1979, Ser. No. 26,373

Int. Cl.³ G02B 7/26

U.S. Cl. 350—96.16 **1 Claim**



1. A method of providing predetermined value of coupling coefficients in a fiber optic T coupler having a notched fiber comprising:

coupling first, second, and third source and receiver systems to the first, second, and third ports of said fiber optic T coupler having a notched fiber;

inserting a mirrored wedge in the notch of said notched fiber; and,

adjusting the depth of insertion of said mirrored wedge as a function of receiver output voltages of said receiver systems to provide said predetermined value of coupling coefficients.

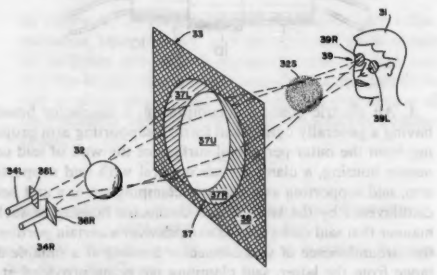
4,346,962
LIGHT ANALYZING LENTICULAR SCREEN FOR VIEWING STEREO IMAGES

Lawrence Holmes, Jr, 605 Hamburg Turnpike, Apt. 102, Pompton Lakes, N.J. 07442

Division of Ser. No. 651,202, Jan. 21, 1976, Pat. No. 4,172,632. This application Jun. 15, 1979, Ser. No. 48,757

Int. Cl.³ G03B 21/60

U.S. Cl. 350—128 **7 Claims**



1. A light-analyzing lenticular screen for intercepting a mixture of light having a first characteristic and light having a second characteristic and for causing one eye of an observer to perceive only said light having said first characteristic and for causing the other eye of said observer to perceive only said light which has said second characteristic, comprising:

a first plurality of linear parallel spaced-apart light-analyzing elements which are at least partially transparent to light having said first characteristic and which are opaque to light having said second characteristic,

a second plurality of linear parallel spaced-apart light-analyzing elements alternated with said first plurality of elements in parallel relationship therewith, said second elements being at least partially transparent to light having said second characteristic and being opaque to light having said first characteristic, and

a lenticular screen disposed parallel to said first and second light-analyzing elements and having lens means for restricting visibility of said first plurality of light-analyzing elements to said one eye and restricting visibility of said second plurality of light-analyzing elements to said other eye.

4,346,963
LIQUID CRYSTAL DISPLAY DEVICE

Manfred Kobale, Faistenhaar, and Hans Krueger, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 6, 1979, Ser. No. 10,260

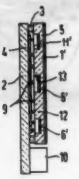
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1978, 2805970

Int. Cl.³ G02F 1/133

U.S. Cl. 350—344 **15 Claims**

1. In a liquid crystal display device having a pair of carrier plates spaced apart by a frame to provide a chamber receiving

a liquid crystal layer, each of said pair of carrier plates on a surface facing said chamber and engaging said layer being provided with electrically conductive coatings with at least one of these coatings being subdivided into separately operable segments with areas of the liquid crystal layer being disposed between an operable segment and the opposite coating and regions of the layer that are not located between an operable segment and the opposite coating, means for maintaining the spacing between the facing surfaces of said carrier plates, and drive circuitry connected to said coatings, the improvements comprising said chamber being constructed to cause said layer to have a thickness in said regions which is less than the thickness of the layer in the areas, said layer being of a cholesteric



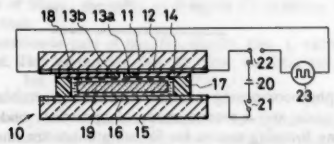
material containing at least one pleochroic dye, said material having a positive dielectric anisotropy and being homeotropically oriented at its plate parallel boundary surfaces, the helical pitch of the liquid crystal being such that in each of said regions, the liquid crystal layer is continuously homeotropically oriented to provide light transmissive zones, in each area at a non-energized segment, the liquid crystal layer has a planar cholesteric or focal-conical orientation and in each area at an energized segment, the layer has a homeotropic orientation to provide light transmissive zones and said drive circuitry being designed to energize each of the segments which belong in a background of the selected image so that the display operates with a complementary drive.

4,346,964

ELECTROCHROMIC DISPLAY DEVICE

Satoshi Ishihama; Taisuke Miyoshi, and Koji Iwasa, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Apr. 25, 1980, Ser. No. 143,911
Claims priority, application Japan, May 28, 1979, 54-065916
Int. Cl.³ G02F 1/17
U.S. Cl. 350—357 **11 Claims**



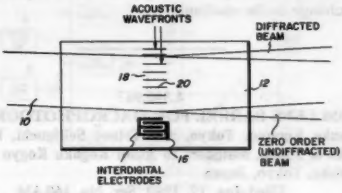
1. In an electrochromic display device of the type having a plurality of electrode segments comprised of electrochromic material in contact with an electrolyte such that the electrode segments exhibit either colored or bleached states depending on the amount of electric charge held by the electrode segments: means for selectively applying a DC electric field between preselected bleached electrode segments and colored electrode segments effective to transfer electric charges between the preselected electrode segments through the electrolyte to thereby change the display state of the electrochromic display device.

4,346,965

LIGHT MODULATOR/DEFLECTOR USING ACOUSTIC SURFACE WAVES

Robert A. Sprague, Saratoga, Calif., and Dror Sarid, Penfield, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 27, 1980, Ser. No. 153,381
Int. Cl.³ G02F 1/16
U.S. Cl. 350—358 **4 Claims**



1. An acousto-optic modulator/deflector system including a light source (34) and an electrical signal source (44) comprising:

a piezoelectric substrate (32) having relatively flat sides,

a set of interdigital electrodes (30) on one side of said substrate (32), said electrodes introducing on the surface of said substrate acoustic waves (38) in response to an electrical signal from said electrical signal source applied to said interdigital electrodes,

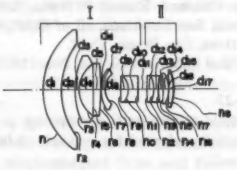
an illuminating light beam from said light source introduced into said substrate (32) through a side adjacent to the side with said interdigital electrodes (30), said beam being directed at said side at an angle such that the light beam suffers total internal reflection near the grazing incidence of the active surface where the acoustic waves (38) are generated, in a plane perpendicular to the direction of travel of the acoustic waves, the output beam being reflected from the active surface containing the acoustic waves and leaving said substrate through the remaining portion of said substrate in a zero order undiffracted direction (48) and a first order diffracted direction (46).

4,346,966

COMPACT LENS SYSTEM OPERABLE IN DIFFERENT MEDIUMS

Akiyoshi Nakamura, Sakai; Toshinobu Ogura, Tondabayashi, and Masahide Tanaka, Toyonaka, all of Japan, assignors to Minolta Camera Co., Ltd., Daisen-Nishimachi, Japan

Filed Jul. 9, 1980, Ser. No. 167,119
Claims priority, application Japan, Jul. 16, 1979, 54-90512
Int. Cl.³ G02B 9/64
U.S. Cl. 350—412 **9 Claims**



1. A compact lens system of optical elements capable of adapting to different mediums comprising;

a first lens group having a front surface directly facing a medium which transmits light to the lens system, the center of curvature of the front surface being located approximately at the entrance pupil of the lens system; and

a second lens group operatively connected to and located at the image side of the first lens group with an air space

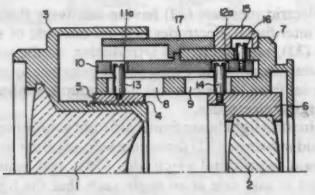
formed between the first and second lens groups, the air space being selected in the overall design of the lens system so that the field curvature of the lens system can be changed without any substantial change in other aberrations by variation of the air space, wherein the air space is changeable by a predetermined value to adjust for the change in the medium adjacent the front surface to maintain a relatively flat image surface irrespective of the change in the medium.

4,346,967

ZOOM LENS BARREL FOR MACROPHOTOGRAPHING

Shinsuke Komoto, Tokyo, and Tetsuo Sekiguchi, Kumagaya, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1980, Ser. No. 160,334
Claims priority, application Japan, Jun. 25, 1979, 54-86911[U]
Int. Cl.³ G02B *7/10*
U.S. Cl. 350—430 **10 Claims**



1. In a zoom lens barrel capable of performing macrophotographing operations including a zooming operation sleeve and a focus operation sleeve in which for zooming said zooming operation sleeve is rotated so that the positions of the first lens group and the second lens group are defined by a zooming cam slot and a lead slot formed in a cam sleeve and for focusing said focus operation sleeve is rotated to thereby determine the position of the first lens group in the direction of the optical axis, said zoom lens barrel being characterized in that a linear slot is provided extending from a telephoto end position of the zooming cam slot forwardly parallel to the optical axis direction of said lens groups.

4,346,968

WALL MOUNTED VISUAL FIELD TESTING SYSTEM

John A. Melin, Oakland; Russell P. Irwin, Berkeley, and Gordon L. Epstein, San Francisco, all of Calif., assignors to Pacific Innovations, San Bruno, Calif.

Filed Feb. 4, 1980, Ser. No. 118,566
Int. Cl.³ A61B *3/02*
U.S. Cl. 351—23 **10 Claims**

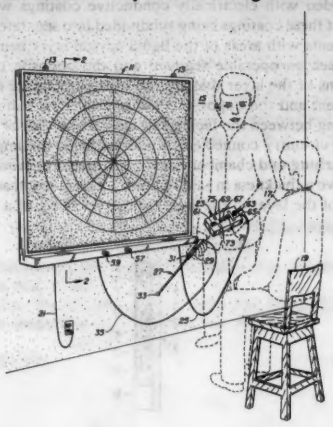
1. A visual field testing unit, comprising:

a frame especially adapted for one side to be hung against a building wall;

a flat semi-transparent tinted sheet held by said frame on an opposite side thereof, a front surface of said sheet being black matte finished,

a plurality of substantially point light sources held by said frame in a spaced apart relationship over a two-dimensional area behind said semi-transparent sheet and characterized by being visible through said sheet when appropriately energized with electrical energy, said sheet attenuating enough light to make said lights normally invisible when they are not energized; and

control means connected to each of said lights for selectively energizing in time sequence various pre-determined distinct combinations of only a few of said lights at one time,



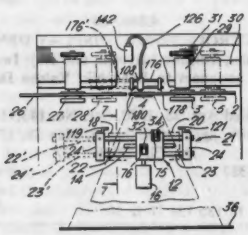
whereby blind spots in a person's visual field of view may be identified.

4,346,969

PHOTOGRAPHIC TYPE COMPOSING MACHINE WITH HEADLINING ATTACHMENT

Louis M. Moyroud, Delray Beach, Fla., assignor to Autologic, S.A., Bussigny-pres-Lausanne, Switzerland

Division of Ser. No. 763,611, Jan. 28, 1977, Pat. No. 4,119,977. This application Jun. 27, 1979, Ser. No. 52,664
Claims priority, application United Kingdom, Jan. 29, 1976, 3642/76
Int. Cl.³ B41B *13/00*
U.S. Cl. 354—7 **4 Claims**



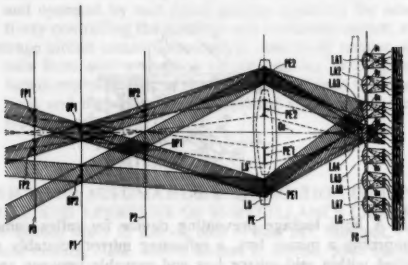
1. A photocomposing machine which is convertible between a first mode and a second mode of operation, said machine including focusing means for focusing character images on a first recording surface during said first mode movable reflector means, and means for enabling said second mode of operation by selectively moving said reflector means into the path of images from said focusing means so as to deflect said images and cause them to be focused on a second recording surface during said second mode of operation, said second recording surface being an elongated strip adapted to receive one line or column of relatively large characters, and including means for rotatably supporting said second recording surface so that said second recording surface is rotatably movable between two positions, one in which said characters are side-by-side on said strip, and the other in which said characters are above or below one another.

4,346,970

FOCUS DETECTING DEVICE

Takashi Kawabata, Kamakura; Tokuichi Tsunekawa, Yokohama; Kazuya Hosoe, Machida; Takao Kinoshita, Tokyo; Shinji Sakai, Tokyo, and Tatsuya Taguchi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1980, Ser. No. 179,548
Claims priority, application Japan, Aug. 24, 1979, 54-107728
Int. Cl.³ G03B 7/08
U.S. Cl. 354—25 20 Claims



1. A TTL type focus detecting device comprising:

a plurality of lens elements positiioned at or near a plane corresponding to a prescribed focal plane of an objective lens;

a plurality of pairs of photosensitive elements corresponding to each of said lens elements;

means for automatically selecting at least one of the pairs of said photosensitive elements corresponding to each of said lens elements; and

circuit means receptive of the outputs of said selected ones of the pairs of said photosensitive elements for detecting whether or not a positional difference is present between two images of an object formed on said plane with two light beams from said objective lens at two virtual exit openings lying almost symmetrical to each other with respect to an optical axis thereof, said circuit means producing an output indicative of whether or not said objective lens is in a sharp focused condition on said object; said automatically selecting means being responsive to an output of said circuit means and making said selection on the basis of said output.

4,346,971

PHOTOGRAPHIC APPARATUS WITH CONTROLLED SHUTTER BLADE TIME OUT

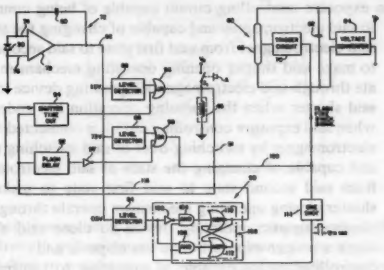
Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 80,431, Oct. 1, 1979, abandoned. This application Sep. 22, 1980, Ser. No. 189,722
Int. Cl.³ G03B 7/097, 7/16, 15/05
U.S. Cl. 354—34 11 Claims

1. In a photograhic camera apparatus of the type for use with a source of artificial illumination and including means for defining a film plane, means for transmitting light from a scene along an optical path to expose photosensitive film located in the film plane, an exposure control system for allowing the passage of scene light along the optical path to the film plane for a period of time to define an exposure interval, means for providing a flash fire signal to ignite the source of artificial illumination at an appropriate instant during the exposure interval, and means for detecting scene light in correspondence with the scene light admitted to the film plane, the improvement comprising:

means responsive to the detection of scene light to a determinate signal level during a select time period immediately following the flash fire signal for providing a select output signal; and

means responsive to said select output signal during said select time period for imposing one maximum time limit to



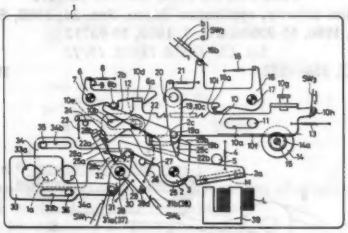
the duration of the exposure interval, said time limit imposing means being further responsive to the absence of said select output signal during said select time period for imposing another maximum time limit to the duration of the exposure interval.

4,346,972

CAMERA EQUIPPED WITH AN AUTOMATICALLY CONTROLLING DEVICE FOR FOCUSING AND SHUTTER OPERATION

Tamotsu Takahashi, Shiki, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Jan. 6, 1981, Ser. No. 222,873
Claims priority, application Japan, Jan. 7, 1980, 55/457
Int. Cl.³ G03B 3/10
U.S. Cl. 354—195 7 Claims



1. A camera having a shutter, comprising:

an electromagnetic operating device including therein a single electromagnet capable of taking a first state and a second state;

a focusing mechanism connected to said electromagnetic operating device and capable of being held normally at its start position;

a focus detection controlling circuit capable of being connected to said electromagnet and capable of changing the state of said electromagnet from said first state to said second state in association with a shutter releasing operation to release said focusing mechanism through said electromagnetic operating device to start the focusing operation and capable of changing again the state of said electromagnet from said second state to said first state to stop the focusing operation of said focusing mechanism through said electromagnetic operating device when focused;

a switching means connected to said focus detection controlling circuit and capable of connecting normally said focus

detection controlling circuit to said electromagnet and capable of being switched over when focused;

shutter opening and closing operating mechanisms capable of being operated by said electromagnetic operating device;

an exposure controlling circuit capable of being connected to said electromagnet and capable of changing the state of said electromagnet from said first state to said second state to make said shutter opening operating mechanism operate through said electromagnetic operating device to open said shutter when the focusing operation has ended and when said exposure controlling circuit is connected to said electromagnet by switching-over of said switching means and capable of changing the state of said electromagnet from said second state to said first state to make said shutter closing operating mechanism operate through said electromagnetic operating device to close said shutter when a proper exposure time has elapsed; and

a controlling means capable of operating to transmit the operation of said electromagnetic operating device to said shutter opening and closing operating mechanisms after the focusing operation has ended.

4,346,973

FOCUSING SCREEN INTERCHANGING DEVICE IN SINGLE LENS REFLEX CAMERA

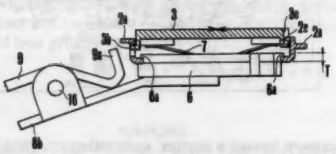
Makoto Katsuma, Yokohama; Masayuki Suzuki, Tokyo; Kenichi Shinbori, Yokohama, and Hiroyasu Murakami, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 30, 1981, Ser. No. 230,272

Claims priority, application Japan, Jan. 31, 1980, 55-12929; Jul. 8, 1980, 55-93006; Jul. 9, 1980, 55-93712

Int. Cl.³ G03B *13/00, 19/12*

U.S. Cl. 354—152 **10 Claims**



5. A focusing screen interchanging device in a single lens reflex camera comprising:

a focusing screen;

a fixture member for fixing the focusing screen to a camera body, said fixture member being united together with the focusing screen and holding the focusing screen in a freely shiftable manner at its inside, said fixture member being further provided in a manner freely attachable to and detachable from the camera;

biasing means to bias the focusing screen, said biasing means being provided at the fixture member;

a standard member provided at the camera body, the focusing screen being pressed against said standard member by the bias force of the biasing member when the fixture member is fixed with the camera body; and

holding means for holding the fixture member within the camera body, said holding means being provided in the camera body.

4,346,974

LIGHT LEAKAGE PREVENTING DEVICE FOR REFLEX CAMERAS

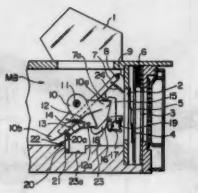
Toshihisa Saito, Tokyo, and Nobuyoshi Inoue, Kawagoe, both of Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed May 18, 1981, Ser. No. 264,694

Claims priority, application Japan, May 19, 1980, 55-68371[U]; May 19, 1980, 55-68372[U]

Int. Cl.³ G03B *19/12*

U.S. Cl. 354—154 **8 Claims**



1. A light leakage preventing device for reflex cameras comprising a mirror box, a reflecting mirror rotatably supported within said mirror box and movable between an up position and a down position, and a light intercepting member capable of being brought to a light intercepting position in association with the movement of said reflecting mirror in order to intercept light passing through between the lower edge of said reflecting mirror and the floor surface of said mirror box when said reflecting mirror is moved from the up position to the down position, said device further comprising a flexible light intercepting member interposed between the upper edge of said reflecting mirror and the rear wall of said mirror box and extending over the entire lateral width of said mirror box.

4,346,975

MULTIPLE CONTROL SYSTEM FOR CAMERA

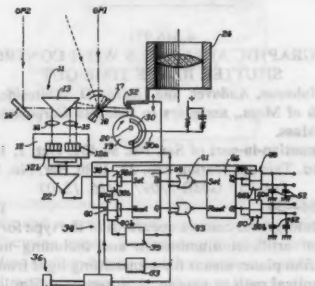
Tadao Isono, Kokubunji, Japan, assignor to Osawa Precision Industries, Ltd., Japan

Continuation-in-part of Ser. No. 860,030, Dec. 12, 1977, abandoned. This application Aug. 2, 1979, Ser. No. 63,021

Claims priority, application Japan, Dec. 10, 1976, 51-147758

Int. Cl.³ G03B *3/10, 7/091*

U.S. Cl. 354—195 **8 Claims**



1. An automatic optical instrument adjusting system for comparing transduced inputs of ambient conditions with the levels representative of states of the instrument and for correctively adjusting the instrument state in response to the difference between the conditions and the state comprising:

focusing means for providing signals dependent on the distance to a subject and converting same to timed pulses representative of each ambient condition;

measuring means defining the setting of the objective lens of the instrument and converting same to timed pulses representative of each operative state;

a timed pulsing apparatus for regularly and periodically issuing controlling signals;

an evaluation circuit for processing two inputted timed pulses and for generating output signals having timing relative to the differences between said two inputted timed pulses;

automatic switch means connected between said focusing means, said measuring means and said evaluation circuit and operated by said timed pulsing apparatus for selectively controlling the inputs to said evaluation circuit; and

storage circuit means connected to selectively receive signals from said evaluation circuit and for holding said signals representative of the difference between the conditions and the states until an updated signal of the same type is received.

4,346,976

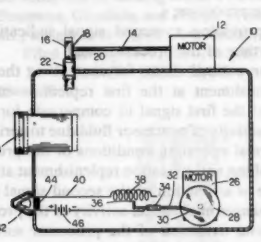
DEVICE FOR AUTOMATIC RECIPROCATION OF LENS ANGLE AND APERTURE OF SURVEILLANCE CAMERA

Milo Kottas; Mary E. Kottas, both of Box 187, Milligan, Fillmore County, Nebr. 68406; Robert P. Kottas, 3000 Farnam St., Apt. 5D, Omaha, Douglas County, Nebr. 68131; Charles E. Kottas, P.O. Box 1006, Grand Island, Hall County, Nebr. 68801, and Joseph W. Kottas, 1640 Burr St., Lincoln, Lancaster County, Nebr. 68502

Filed Mar. 12, 1981, Ser. No. 242,874

Int. Cl.³ G03B *3/00, 13/02, 7/08*

U.S. Cl. 354—196 **4 Claims**



1. A surveillance camera comprising: a lens of variable angle and motor actuated cam means for automatically and continually reciprocating the angle of the lens between a wide setting and a narrow setting.

4,346,977

BLADE TYPE FOCAL PLANE SHUTTER

Osamu Ooba, Kohokudai 9-8-18, Abiko-shi, Chiba-ken, Japan

Continuation-in-part of Ser. No. 113,031, Jan. 15, 1980, abandoned. This application Apr. 29, 1981, Ser. No. 258,784

Claims priority, application Japan, Jan. 19, 1979, 54-5452[U]

Int. Cl.³ G03B *9/40*

U.S. Cl. 354—246 **9 Claims**

1. A blade type focal plane shutter comprising:

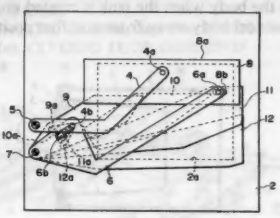
a shutter base plate having an exposure aperture therein;

a main arm rotatably supported on said base plate at the side of said exposure aperture;

an auxiliary arm rotatably supported on said base plate at the side of said exposure aperture and pin-slot-connected to said main arm;

a plurality of auxiliary opaque laminae rotatably supported by a common shaft on said base plate at the side of said exposure aperture, each of said auxiliary laminae being pin-slot-connected to said main arm and respectively movable between exposure aperture covering positions and exposure aperture opening positions; and

a main opaque lamina pivoted on said main arm and pin-slot-connected to said auxiliary arm and movable between an exposure aperture covering position and an exposure aperture opening position to form an exposure slit, said



main lamina being made of material comparatively high in strength and said auxiliary laminae being made of material lighter in weight than the material of said main lamina.

4,346,978

OPERATING AID ARRANGEMENT FOR CAMERAS

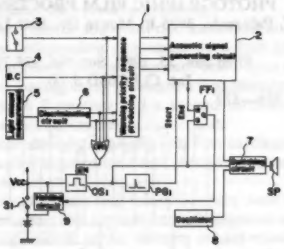
Nobuyuki Taniguchi, Sakai; Masaaki Nakai, Nara; Tokuji Ishida, Daito, and Isamu Uchida, Kawachinagano, all of Japan, assignors to Minolta Camera Company, Sakai, Japan

Filed Dec. 2, 1980, Ser. No. 212,152

Claims priority, application Japan, Dec. 3, 1979, 54-157212; Dec. 3, 1979, 54-157213; Dec. 3, 1979, 54-157214

Int. Cl.³ G03B *17/18*

U.S. Cl. 354—289 **25 Claims**



1. A camera capable of informing a person of conditions of a camera by means of voice comprising:

means for detecting a camera condition;

means for selecting a plurality of information in a predetermined order in response to said detecting means;

means for generating a voice to narrate said plurality of said information in said predetermined order; and

means for producing a preparatory sound to call the attention of the person to the camera prior to the narration.

4,346,979

PHOTOGRAPHIC DEVELOPING TANK

Guy Faubert, Creteil, France, assignor to Diaralux, Creteil, France

Filed Feb. 24, 1981, Ser. No. 237,664

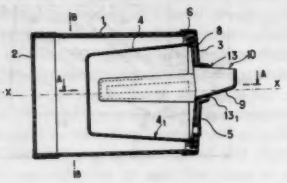
Claims priority, application France, Aug. 18, 1980, 80 18060

Int. Cl.³ G03D *13/04*

U.S. Cl. 354—307 **9 Claims**

1. A light-tight photographic developing tank comprising a cylindrical body (1) containing a cup (4) to receive a product before said product acts on an exposed sensitive paper disposed within the body, the cup having a filling orifice (10) on an extremity opening to the exterior of the body for filling the cup with the product when the tank is in a first position wherein said filling orifice (10) is substantially horizontal, said cup (4)

further comprising at least one discharge orifice (12) opening into the interior of the body (4) to discharge the product in the cup into the body when the tank is rotated around the axis of the cylindrical body away from said first position, said filling



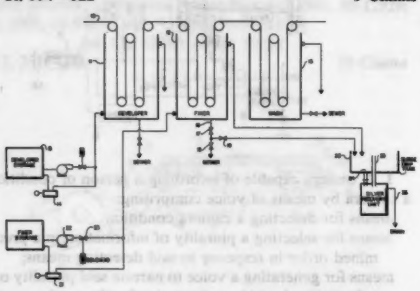
orifice (10) being oriented laterally to the axis of the body of the tank (1), and, when the tank is in said first position, the discharge orifice (12) being disposed above the lower generatrix of the cup disposed in the axial plane of the cup which is perpendicular to the plane of the filling orifice (10).

4,346,980

SILVER RECOVERY SYSTEM FOR X-RAY AND PHOTOGRAPHIC FILM PROCESSORS

James C. Palazzolo, 3605 E. Monza Dr., Salt Lake City, Utah 84119

Filed Jan. 25, 1980, Ser. No. 115,210
Int. Cl.[3] G03D *3/06*
U.S. Cl. 354—322 9 Claims



1. An automated film processor having individual developer, fixer and washer containers and with means for continuously transporting x-ray film through said tanks serially and associated with a removeable silver recovery unit comprising:

overflow means on said fixer container;

bottom discharge means on said fixer container;

a surge-drip tank having a capacity at least as large as said fixer container, said surge-drip tank having a lower discharge orifice sized to discharge liquid at a slow flow rate and an upper overflow port, said overflow port and said discharge orifice positioned to drain liquid into said removeable silver recovery unit;

overflow conduit means connecting said fixer container overflow with surge-drip tank;

developer automatic refill means connected to said developer container;

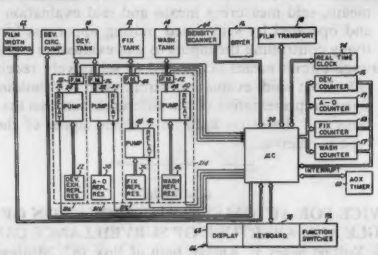
fixer automatic refill means connected to said fixer container.

4,346,981

DUAL RATE AUTOMATIC ANTI-OXIDATION REPLENISHER CONTROL

Kenneth M. Kaufmann, Minneapolis, Minn., assignor to Pako Corporation, Del.

Continuation-in-part of Ser. No. 168,020, Jul. 14, 1980, Pat. No. 4,295,729. This application May 15, 1981, Ser. No. 263,868
Int. Cl.[3] G03D *3/06*
U.S. Cl. 354—324 9 Claims



1. In a processor of photosensitive material in which anti-oxidation replenishment is provided, the improvement comprising:

means for storing a first replenishment rate and a second, lower replenishment rate;

means for providing a first signal indicative of operating time of the processor;

means for providing a second signal indicative of non-operating time of the processor; and

anti-oxidation control means for controlling the anti-oxidation replenishment at the first replenishment rate as a function of the first signal to compensate for changes in chemical activity of processor fluid due to aerial oxidation under normal operating conditions of the processor, and for controlling anti-oxidation replenishment at the second, lower rate as a function of the second signal to compensate for changes in chemical activity of the processor fluid due to aerial oxidation of the processor solution under non-operating conditions of the processor.

4,346,982

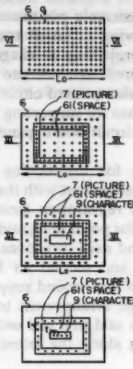
ELECTROPHOTOGRAPHIC RECORDING DEVICE

Junzo Nakajima, Kawasaki; Masayuki Hida, Yokohama, and Masakatsu Horie, Atsugi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 11, 1980, Ser. No. 139,402
Claims priority, application Japan, Apr. 20, 1979, 54-48675
Int. Cl.[3] G03G *15/048, 15/30*
U.S. Cl. 355—3 R 6 Claims

1. An electrophotographic recording device comprising: a light-sensitive recording medium, means for uniformly precharging the surface of said light-sensitive recording medium, means for forming a latent image of a picture on the charged lightsensitive recording medium by exposure of a positive optical image of the picture, means for forming latent images of characters on the charged light-sensitive recording medium by exposure of negative optical images of the characters, and means for development of the latent images formed on the light-sensitive recording medium including a magnetic roller having a potential selected as a predetermined value between

the potential of the precharged light-sensitive recording medium and zero potential and single component toner for devel-



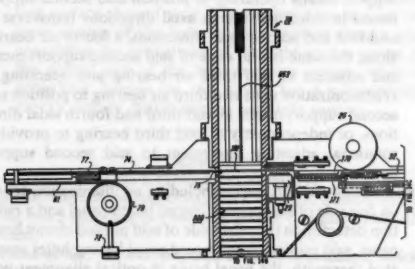
opment of said latent images of both the picture and the characters.

4,346,983

XERORADIOGRAPHIC INTRAORAL DENTAL SYSTEM

Lothar S. Jeromin, Sierra Madre; Glenn F. Geddes, Alta Loma; Otto S. Baumann, Glendale, and Joseph F. Santoro, Glendora, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 24, 1979, Ser. No. 60,074
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 R **1 Claim**



1. A xerographic system for developing X-ray sensitive plates of differing sizes enclosed in optically opaque covers comprising:

an input station into which an exposed plate and its cover is inserted comprising means for removing said plate from said cover,

a development station for producing an image from said exposed plate onto some recording media,

means for storing a plurality of plates of differing sizes,

means for charging said plates,

an output station into which an empty cover is inserted comprising means for determining the size of said cover, and means for inserting a charged plate into said cover,

means for transporting plates through said input station, said development station, means for storing, means for charging and said output station, in that order, and

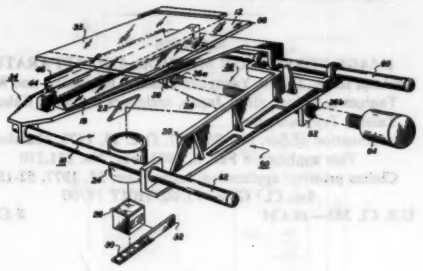
wherein said means for storing is responsive to said output station determining means to supply to the charging means and thereafter to said output station a plate of a size corresponding to that of said cover.

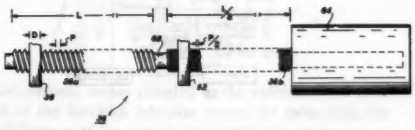
4,346,984

DOCUMENT SCANNER

William Kingsley, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 20, 1980, Ser. No. 198,392
Int. Cl.³ G03G *15/28*; G03B *27/38*
U.S. Cl. 355—8 **6 Claims**





3. A scanning system for incrementally scanning a document in an object plane, the system comprising

a full rate scan mirror and a half rate mirror mounted respectively for independent movement on a first and second movable carriage disposed beneath said object plane,

a lead screw having along its length a first threaded segment with a pitch P cm/rev and a second threaded segment with a pitch P/2/cm/rev,

means for threadingly engaging said first carriage with said first threaded segment and said second carriage with said second threaded segment, and

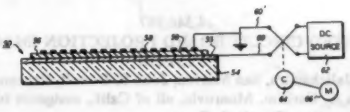
means for rotating said lead screw whereby each carriage is advanced along the respective shaft segment at a rate of speed proportional to the velocity of said rotating means and the respective segment pitch.

4,346,985

AUTOMATIC DEVELOPMENT CONTROL

P. Keith Watson, and Lawrence J. Fraser, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 25, 1979, Ser. No. 51,650
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 D **2 Claims**



1. An automatic development control apparatus for use in electrophotographic machines wherein a pair of said parallel members form a channel through which developer material passes, one of members being constructed such that toner can be electrostatically attracted thereto and scavenged therefrom for permitting the concentration of the toner in the developer to be measured from the optical density of the toner attracted to the said one of the members, the improvement comprising said one of said members comprising:

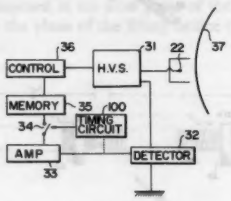
a uniform, transparent conductive substrate;
a transparent insulating layer covering said substrate;
a plurality of spaced-apart, opaque fingers on said insulating layer, said fingers being interconnected and electrically conductive;
means for grounding said fingers and
means for alternately applying positive and negative voltages to said substrate.

4,346,986

IMAGE FORMATION METHOD AND APPARATUS

Tsuksa Kuge, Tokyo; Yasuyuki Tamura, Kawasaki, and Koichi Tanigawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 969,887, Dec. 15, 1978, abandoned. This application Feb. 3, 1981, Ser. No. 231,110
Claims priority, application Japan, Dec. 22, 1977, 52-154623
Int. Cl.³ G03G *15/02*; H01T *19/00*
U.S. Cl. 355—14 CH **8 Claims**



1. An image forming apparatus comprising:
a plurality of process means for forming an image on a rotatable medium and for transferring the image onto a transfer material;
means for rotating said rotatable medium through an initial one turn without an image forming operation before the start of image formation and for subsequently rotating said rotatable medium for image formation after completion of said initial turn, wherein said rotatable medium is placed in a standard state by uniformly charing it during said initial turn;
detecting means for detecting an electrical condition of one of said process means when said rotatable medium is rotated during the time of said initial turn by said rotating means before the start of image formation; and
control means for controlling, during said initial turn, said one process means in response to said detecting means to approach an electrical condition having a predetermined value, memorizing the resultant value of the approaching control and holding it after the start of the image formation during at least the time of the image forming operation, wherein said control means controls, during the image forming operation, said one process means in accordance with the memorized value and independently of said detecting means.

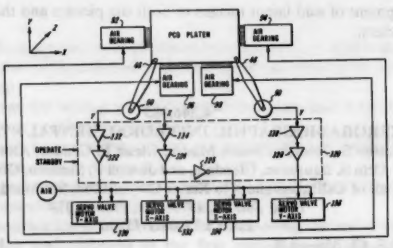
4,346,987

PRINTED CIRCUIT BOARD PROJECTION IMAGING SYSTEM

Phijit Jalichandra, San Marino; John S. Dowell, Rosemead, and John A. Carlson, Monrovia, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 18, 1980, Ser. No. 170,198
Int. Cl.³ G03B *27/52*
U.S. Cl. 355—40 **5 Claims**

1. Apparatus for producing printed circuit boards including a projection imaging system for projecting an electrical circuit image from a master onto a radiation sensitive coated printed circuit board panel positioned at a location spaced apart from said master, said projection imaging system comprising:
means for generating radiation;
first support means for supporting said master, said master having said circuit pattern formed thereon in a predetermined size format, said radiation being incident on said pattern;
a projection lens assembly positioned with respect to said master for receiving radiation transmitted through said master and for projecting an image having a size format larger than said predetermined size format onto said radiation sensitive coated printed circuit board panel;
second support means for supporting said radiation sensitive coated printed circuit board panel at said spaced apart location;
registration means for maintaining said second support means in optical alignment with the image projected from said master, said registration means comprising at least two air bearings for positioning said second support means in first and second axial directions, said two air bearings comprising first and second air bearings positioned at opposite edges of said second support means and operating in a push-pull arrangement to position said second support means in said first and second axial directions, a third air bearing along the lateral edge of said second



support means operating to position said second support means in third and fourth axial directions transverse to said first and second axial directions, a fourth air bearing along the same lateral edge of said second support means and adjacent to said third air bearing and operating in synchronization with said third air bearing to position said second support means in said third and fourth axial directions, or independently of said third bearing to provide a rotational adjusting movement to said second support means;
said second support means including an illumination source on one side of said printed circuit board panel and a radiation detector on the other side of said printed circuit board panel, said printed circuit board panel having holes associated therewith, the panel being in optical alignment with the image projected from said master when the radiation generated by said illumination source passes through said holes and is detected by said radiation detector; and
means for maintaining the spacing between the radiation generating means and the master and the master and the radiation sensitive coated printed circuit board panel substantially constant.

4,346,988

DISTANCE MEASURING DEVICE

Hiroyuki Kimura, Kawasaki; Shuichi Tamura, Yokohama, and Hideo Yokota, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

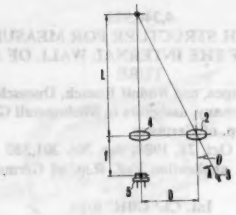
Filed Nov. 6, 1979, Ser. No. 91,777
Claims priority, application Japan, Nov. 10, 1978, 53-138438
Int. Cl.³ G01C *3/00, 5/00*; H01L *9/00*
U.S. Cl. 356—1 **3 Claims**

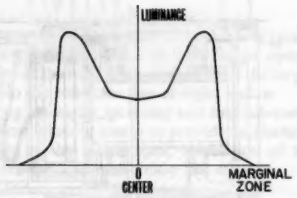
1. A distance measuring device for measuring a distance from the device to an object by the triangulation principle having:
(a) light source means provided with a light source and light

projecting means and positioned to define a predetermined illumination domain on said object;

(b) light sensitive means arranged in spaced relation from said light source means by a predetermined distance and responsive to light reflected from said projection domain for producing a predetermined signal;

(c) either said light source means or said light sensitive means being movable along a predetermined path; and





(d) said light source being constructed to provide a higher radiant energy density at its marginal zone of a light emitting surface thereof than at its central zone at least on a cross section of the light emitting surface along a plane containing the optical axis of the light source means and the optical axis of the light sensitive means, while the projection domain on the object has a corresponding energy density distribution as said light source.

4,346,989

SURVEYING INSTRUMENT

Alfred F. Gort, Loveland, Colo., and Charles E. Moore, Rochester, N.Y., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 842,864, Oct. 17, 1977, abandoned, which is a division of Ser. No. 742,938, Nov. 18, 1976, Pat. No. 4,108,539.

This application Aug. 30, 1979, Ser. No. 71,433

Int. Cl.³ G01C *3/08;* G01B *11/26*

U.S. Cl. 356—5 **1 Claim**

1. A tacheometer comprising:

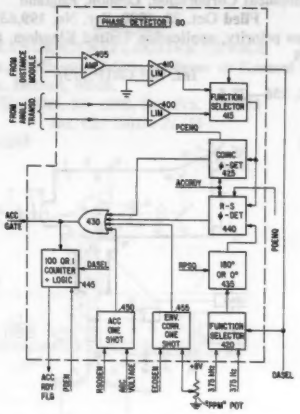
first reference signal generation means for producing a first reference signal having a first frequency;

distance measuring means coupled to the first reference signal generation means for measuring a distance and producing a distance output signal having a frequency equal to the first frequency and a phase shift with respect to the first reference signal indicative of the measured distance;

second reference signal generation means for producing a second reference signal having a second frequency;

angle measuring means coupled to the second reference signal generation means for measuring an angle and producing an angle output signal having a frequency equal to the second frequency and a phase shift with respect to the second reference signal indicative of the measured angle;

function selection means coupled to the first reference signal and the distance output signal and also to the second reference signal and the angle output signal, for respectively producing at first times upon a reference output and a data output the first reference signal and the distance output signal and also for respectively producing thereupon at second times the second reference signal and the angle output signal; and



phase measurement means coupled to the reference and data outputs of the function selection means for measuring the phase difference of the signals thereupon and producing an output signal indicative of that phase difference.

4,346,990

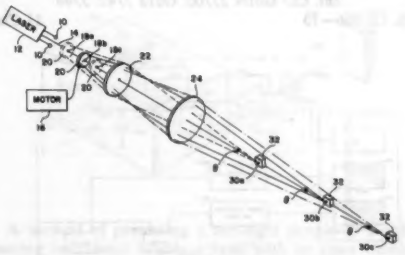
SCANNING AFOCAL LASER VELOCIMETER PROJECTION LENS SYSTEM

David B. Rhodes, Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 7, 1979, Ser. No. 73,477

Int. Cl.³ G01P *3/36;* G02B *3/00*

U.S. Cl. 356—28.5 **5 Claims**



1. An optical scanner for focusing light beams at points in space comprising:

afocal lens means providing constant crossbeam angle, constant focal volume and constant magnification;

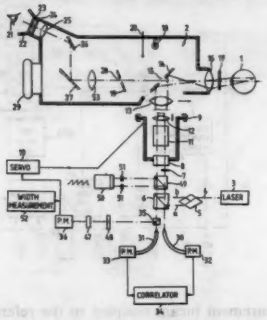
scanning lens means having a common optical axis with said afocal lens means; and

means for moving said scanning lens means along the optical axis relative to said afocal lens means to scan points in space.

4,346,991
METHOD AND APPARATUS FOR MEASURING RETINAL BLOOD FLOW

Keith Gardner; Edward R. Pike, both of Malvern, and David W. Hill, London, all of England, assignors to National Research Development Corporation, London, England

Filed Oct. 22, 1980, Ser. No. 199,639
Claims priority, application United Kingdom, Oct. 31, 1979, 7937799
Int. Cl.³ G01P 3/36
U.S. Cl. 356—28.5 9 Claims

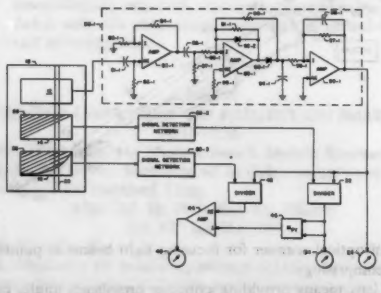


1. Apparatus for measuring retinal blood flow comprising a fundus camera for observation of the fundus of an eye, a laser for illuminating a portion of a retinal blood vessel, means for detecting laser radiation scattered by the eyes to determine retinal blood flow from the doppler shift imparted to the laser radiation by moving blood corpuscles, and an optical system for directing twin beams of laser radiation along an optical path into the eye and directing radiation reflected by the eye back along the optical path into the detecting means, the optical system including a beam rotator for rotating the plane containing the two beams to align along a retinal blood vessel, and means for causing the twin beams to intersect where required in the eye.

4,346,992
LASER DETECTOR AND SPECTRAL ANALYZER

Jacob Schwartz, Arlington, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Continuation-in-part of Ser. No. 797,596, Feb. 7, 1969, abandoned. This application Feb. 15, 1973, Ser. No. 332,827
Int. Cl.³ G01N 21/00; G01J 1/42, 3/48
U.S. Cl. 356—73 11 Claims



1. Apparatus for the detection and spectral analysis of radiant light energy comprising:

a wedge filter having a predetermined variation in optical passband which is dependent upon the position thereon;

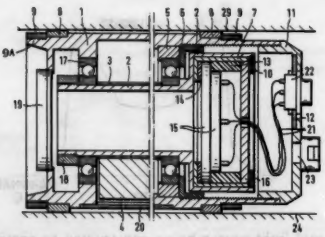
photoelectric detection means disposed behind said filter and responsive to energy transmitted thereby to produce a first output signal which increases linearly with the position at which energy is transmitted by said filter and a second output signal which increases quadratically with said position; and

signal processing means coupled to said detection means for combining said output signals such as to provide outputs representative of selected spectral properties of said energy.

4,346,993
PULL-THROUGH STRUCTURE FOR MEASURING THE CURVATURE OF THE INTERNAL WALL OF A PIPE OR TUBE

Elmar Trost, Ratingen, and Rudolf Reusch, Duesseldorf, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Oct. 27, 1980, Ser. No. 201,330
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1979, 2945290
Int. Cl.³ G01C 9/06
U.S. Cl. 356—138 10 Claims



1. A pull-through structure for measuring the flexure of the inner wall of a pipe or tube, by means of a laser beam emanating from a laser beam emitter and substantially axially passing through said pipe or tube comprising in combination,

a casing coaxially mounted in said pipe or tube and adapted to be slidably axially pulled therethrough,

measuring means operatively mounted in said casing and adapted to measure the flexure of said pipe or tube at the position of said casing therein,

said measuring means comprising a laser beam detector freely swingably mounted in said casing about the axis of the casing and thereby about the axis of the pipe or tube to be measured, said laser beam detector having a dead weight eccentrically fixed thereto which maintains said laser beam detector in a predetermined angular position in said casing.

4,346,994
SECONDARY ALIGNMENT TARGET FOR AN ELECTRO-OPTICAL ALIGNMENT MEASURING SYSTEM

Jose C. Cruz, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jun. 25, 1980, Ser. No. 162,937
Int. Cl.³ G01B 11/26
U.S. Cl. 356—152 21 Claims

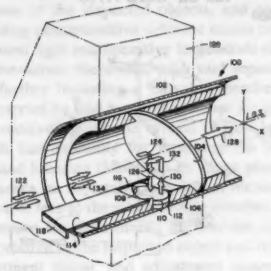
1. A target apparatus for use in optically determining the translational and rotational orientation of a target station relative to a reference line-of-sight established by an optical beam, said target apparatus comprising:

(a) a housing structure mountable in fixed relationship to the target station;

(b) beam splitting means positioned by said housing structure to transmit a first portion of the optical beam in a continuous path along the established reference line-of-sight

while simultaneously reflecting a second portion of the optical beam at an angle relative to the reference line-of-sight;

(c) optical window means disposed in said housing structure to receive said second portion of the optical beam and to transmit a first sub-portion of said second beam portion while simultaneously reflecting a second sub-portion of said second beam portion back toward said beam splitting



means such that said second sub-portion is rereflected at said beam splitting means to provide an optical signal indicative of the rotational orientation of the target station relative to the reference line-of-sight; and

(d) detecting means for receiving said first sub-portion from said optical window means to provide an electrical signal indicative of the translational orientation of the target station relative to the reference line-of-sight.

4,346,995

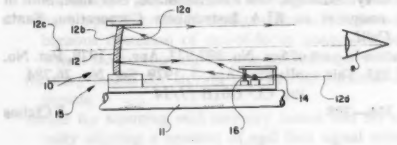
OFF AXIS OPTICAL SIGHT SYSTEM FOR A FIREARM

Donald D. Morris, 7904 N. Arizona Dr., Raleigh, N.C. 27604

Filed Jul. 14, 1980, Ser. No. 168,607

Int. Cl.³ G02B 27/34

U.S. Cl. 356—251 **3 Claims**



1. An off axis optical sight system for a firearm such as a rifle especially designed to be effective in situations where a target is situated in a dim or dark area a substantial distance from the observer and firearm, comprising: a generally fully transparent single concave meniscus lens of approximately zero refractive power and having an optical axis lying generally below the concave meniscus lens and parallel to the line of sight and convex and concave opposite sides with the concave side directly facing the eye of the observer sighting through said optical sight system; a light source disposed on said optical axis at generally the reflective focal point of said concave meniscus lens between the concave meniscus lens and the observer's eye; spherical aberration corrective lens means disposed inwardly of the reflective focal point of said fully transparent single concave meniscus lens and interposed between said light source and said concave meniscus lens for providing for the parallel passage of light from said concave meniscus lens to the observer's eye so as to correct the spherical aberration of said concave meniscus lens when acting as a reflector by effectively bringing the image of said light source to the same aiming point over substantially the entire visual field of said concave meniscus lens; and therein the respective surfaces of said concave meniscus lens are so proportioned to produce two coinciding images of the light source that appear at infinity in focus on a selected target, whereby the fully transparent concave meniscus lens allows maximum light to pass therethrough to the observer's eye such that the target appears clear to the observer.

4,346,996

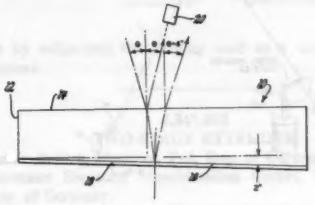
STANDARD REFLECTIVE DEVICE

Carl E. Miller, Millington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 23, 1980, Ser. No. 199,973

Int. Cl.³ G01N 21/55

U.S. Cl. 356—243 **1 Claim**



1. A standard reflecting device for an optical apparatus comprising a wedge shaped element having a flat polished front surface for specular reflection of a predetermined fraction of radiation incident thereupon, and a rear surface inclined at an angle to the front surface and treated with an antireflection coating to minimize reflected radiation from the rear surface, the element being selected from the family of materials consisting of semitransparent crystals and glasses wherein for near normal incidence the reflected fraction substantially equals $(n-1)^2/(n+1)^2$ where n is the index of refraction of the material at the wavelength of the incident radiation.

4,346,997

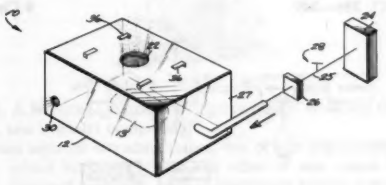
POSITIVE PRESSURE MAINTENANCE FOR SAMPLE PRESENTATION

Robert F. Willis, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Jun. 9, 1980, Ser. No. 157,841

Int. Cl.³ G01N 21/57; G01J 3/46

U.S. Cl. 356—244 **25 Claims**



1. A method of presenting a non-rigid sample to a color measuring instrument having a head with an open viewing port, comprising the steps of

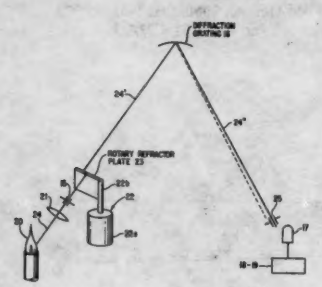
(a) continuously supplying fluid under pressure to the instrument head to exhaust through the viewing port to prevent sample lint and dust from entering the head, to facilitate removal of heat generated by the instrument, and to facilitate maintenance of a sample so that a flat, distortion-free surface can be examined; and

(b) exhausting the fluid supplied to the instrument head from a location distinct from the viewing port when the viewing port is covered with a sample to be examined.

4,346,998
BACKGROUND CORRECTOR FOR SPECTROCHEMICAL ANALYSES OF BIOLOGICAL SAMPLES

Michael L. Franklin, Parsippany, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 741,814, Nov. 15, 1976, abandoned. This application Aug. 20, 1979, Ser. No. 68,239
Int. Cl.³ G01J 3/06, 3/38; G01N 21/73
U.S. Cl. 356—307 7 Claims

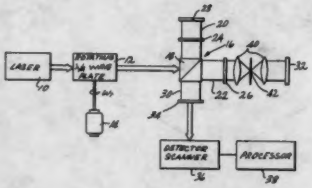


1. In an emission spectrometer arrangement for determining the amount of one or more trace substances of interest in a biological sample and having means providing dynamic background correction with each wavelength of interest of the electromagnetic radiation spectrum, the improvement comprising first means receiving a collected electromagnetic radiation emission beam derived from the sample for determining the intensity of said beam over at least one preselected range of the electromagnetic spectrum, said first means including a rotatable refractor plate which is mounted off-axis with respect to the beam whereby the plate will move into and out of the path of the beam while rotating at a constant angular velocity, said first means receiving said beam during the period the plate is in and out of the path of the beam.

4,346,999
DIGITAL HETERODYNE WAVEFRONT ANALYZER

Norbert A. Massie, Westlake Village, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 29, 1980, Ser. No. 191,604
Int. Cl.³ G01B 9/02
U.S. Cl. 356—349 9 Claims

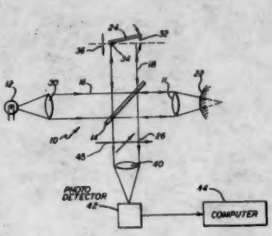


5. A wavefront analyzer comprising an interferometer including a beam splitter for directing an incoming beam along two paths, mirror means for reflecting the beams along said two paths back to the beam splitter, the beam splitter directing the beam along a common output path, a quarterwave plate along each of said two paths between the beam splitter and the mirror means, a polarizer along the output path of the interferometer, means detecting variations in light level in the output from the polarizer, and means for converting the reflected wave travelling along one of said two paths into a plannar wavefront for subsequent interference with the wave travelling along the other one of said two paths.

4,347,000
INTERFEROMETRIC SYSTEM

Francois P. G. Lacoste, Norwalk, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Dec. 26, 1979, Ser. No. 106,874
Int. Cl.³ G01B 11/00
U.S. Cl. 356—360 9 Claims

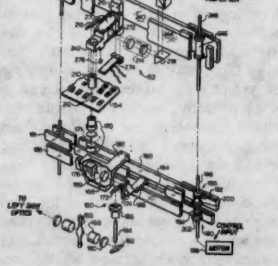


9. A method of testing a lens comprising the steps of:
(a) splitting a light beam into first and second light beams,
(b) supporting a lens to be tested in the path of said first light beam,
(c) reflecting said first and second light beams to recombine and form a single recombined light beam,
(d) varying the angle of reflection and path length of the second light beam, and
(e) photoelectrically detecting the entire recombined beam to generate an output signal representative of the complex point spread function of the lens.

4,347,001
AUTOMATIC PHOTOMASK INSPECTION SYSTEM AND APPARATUS

Kenneth Levy, Saratoga, and Paul Sandland, San Jose, both of Calif., assignors to KLA Instruments Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 892,972, Apr. 4, 1978, Pat. No. 4,247,203. This application Apr. 3, 1979, Ser. No. 26,784
Int. Cl.³ G01B 11/14
U.S. Cl. 356—398 3 Claims



1. Optical inspection apparatus for detecting differences between two like objects, comprising:
carriage means for supporting the objects to be inspected

and for simultaneously moving such objects along an inspection path;

illuminator means for illuminating corresponding portions of said objects as they are moved along said path;

electro-optical means for individually inspecting said illuminated portions and for developing first and second electrical signals respectively corresponding thereto, said electro-optical means including separate optical systems for respectively collecting light from said corresponding portions of the inspected objects, and each said system including photosensitive detector means responsive to the collected light and operative to generate electrical signals commensurate therewith, each said separate optical system further including a movable member, an objective lens carried by said movable member for collimating light rays received from one of said objects, a variable focal length lens assembly for receiving the collimated light rays and focusing them onto an image plane at said detector means, an adjustable attachment means mounting said objective lens to the said movable member, focus monitoring means for determining the position of said objective lens relative to the inspected object and for developing an adjustment signal, and adjustment means responsive to said adjustment signal and operative to adjust said attachment means so as to maintain said objective in a focused position relative to the inspected object, the movable member of one of said separate optical systems being mechanically coupled to the movable member of the other of said separate optical systems such that movement of one of said members in one direction causes a like movement of the other of said members in the opposite direction, said focus monitoring means including a laser for passing a narrow beam of light through at least a portion of said separate optical system at an angle relative to the optical axis thereof and onto a peripheral spot of the inspected object, and means disposed along said optical axis for detecting the position of said spot relative to said focused position and for developing said adjustment signal commensurate therewith, said focus monitoring means further including an aperture disposed within the path of the incident laser beam so as to cause the beam spot to have a predetermined configuration which permits unambiguous detection of out-of-focus images caused by an object surface having varying reflectivity;

memory means for storing said first and second electrical signals;

means for scanning said memory means and for electronically aligning a readout of said first signal relative to a readout of said second signal; and

means for comparing the electronically aligned signals and for indicating any difference therebetween.

4,347,002

METHOD AND APPARATUS FOR THE PREPARATION OF DRILLING MUD

Raisa I. Born, kvartal 24, 53, kv. 89, Tashkent, Chilanzar, U.S.S.R.

PCT No. PCT/SU79/00090, § 371 Date Sep. 16, 1980, § 102(e) Date Sep. 11, 1980, PCT Pub. No. WO80/01495, PCT Pub. Date Jul. 24, 1980

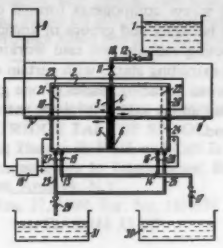
PCT Filed Sep. 28, 1979, Ser. No. 205,441

Claims priority, application U.S.S.R., Jan. 16, 1979, 2705502

Int. Cl.³ B28C *5/46;* B01F *15/02, 11/00*

U.S. Cl. 366—6 **15 Claims**

1. A method for the preparation of drilling mud comprising mixing solid and liquid phases of drilling mud to obtain a homogenous suspension, characterized in that drilling mud is caused to pass under pressure after the mixing through apertures of a diameter which is greater than maximum size of an individual solid phase particle but smaller than the diameter of aggregates of particles, to prepare dispersed drilling mud, and wherein the pH of the drilling mud is caused to grow simultaneously with the passage of the drilling mud through the apertures by subjecting the drilling mud to a unipolar electric treatment.



4,347,003

TWO-STAGE EXTRUDER

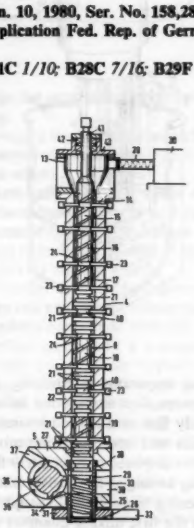
Dietmar Anders, Hanover, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Jun. 10, 1980, Ser. No. 158,281

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1979, 2924317

Int. Cl.³ A21C *1/10;* B28C *7/16;* B29F *3/01*

U.S. Cl. 366—75 **5 Claims**



1. A two-stage extruder for thermoplastic moulding materials, said extruder comprising:

two separate extruding stages, one of said stages being disposed horizontally and the other of said stages being disposed vertically, each of said stages having a working chamber, said chambers being in communication with each other at a common junction between the stages for allowing material to pass from the working chamber of one stage to the working chamber of the other stage, said chambers also being radially offset from each other at said junction such that the axis of each stage does intersect the axis of the other stage at said junction, said chambers meeting tangentially at said junction to form a connecting passage for said communication;

a rotatable plasticizing member disposed in said vertical chamber of said vertical extruding stage;

kneading blades connected to said plasticizing member, said kneading blades being disposed in groups wherein each

kneading blade of each group extends radially of said vertical chamber and is circumferentially offset with respect to the next adjacent blade in the same group;

conveying screw components formed on said plasticizing member between said groups of kneading blades;

pins projecting radially into said working chamber of said vertical extruding stage, with certain of said pins extending between kneading blades of one group; and

a bearing mounting said plasticizing member rotatably at its upper end.

4,347,004

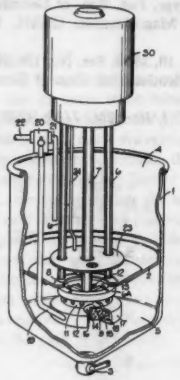
MIXING APPARATUS

Stanley A. Platts, Warley, England, assignor to Unishear Mixers Limited, Tipton, England

Filed Jun. 13, 1979, Ser. No. 48,259

Int. Cl.³ B01F *7/26*

U.S. Cl. 366—137 **13 Claims**



1. A mixing apparatus comprising a container having a separate enclosure, first and second mixing chambers containing respectively first and second bladed rotary impellers and disposed within said enclosure, the mixing chambers having respective inlets disposed in oppositely facing relationship, the container being arranged to receive material to be mixed supplied to an opening thereof and to supply said material in a first direction into the first mixing chamber through its respective inlet, means surrounding the first impeller forming generally radial openings and being arranged in shearing relation to the blades of the first impeller so that material urged radially outwardly through said openings into an intermediate chamber by rotation of the impeller is subjected to a shearing action, the enclosure being arranged to receive material leaving the first mixing chamber and to communicate with the inlet of the second mixing chamber in a second direction opposed to said first direction, further means surrounding the second impeller forming generally radial openings and arranged in shearing relation with the blades of the second impeller so that material urged outwardly through said openings by rotation of the second impeller is subjected to a shearing action, and a discharge chamber having an outlet and arranged to receive material passing through the openings of said further means and being so constructed and arranged that receipt of such material creates an over pressure in the discharge chamber such that material may be discharged under pressure through said outlet.

4,347,005

MECHANISM TO FACILITATE TYPE DISC CHANGES

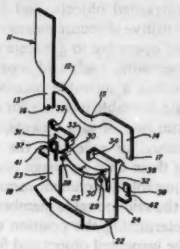
Josef Lendl, Ottensoos, Fed. Rep. of Germany, assignor to Triumph-Adler A.G., Nuremberg, Fed. Rep. of Germany

Filed Oct. 2, 1980, Ser. No. 193,310

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1980, 3011116

Int. Cl.³ B41J *1/24*

U.S. Cl. 400—144.2 **4 Claims**



1. In a typewriter having a support frame for supporting a positioning motor and shaft having a type disc removably mounted on the end of said shaft,

means for facilitating type disc changes comprising support means secured to said support frame,

means for axially pushing said type disc off said shaft comprising flexible fingers extending upwardly from said support means with the upper ends thereof on opposite sides of said shaft on the motor side of said type disc and normally out of contact with said type disc,

lever means, and

means pivotally supporting said lever means for movement relative to said support means,

said lever means being normally biased to rest position by said flexible fingers and being pivotally movable to push said flexible fingers against and to axially push off and disengage said type disc from said shaft.

4,347,006

PAPER INSERT AND LINE FEED MECHANISM

Iraj D. Shakib, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 1, 1980, Ser. No. 211,996

Int. Cl.³ B41J *11/36, 23/34*

U.S. Cl. 400—187 **14 Claims**

1. A motor driven indexing system for indexing a platen of a printer comprising:

a motor having a continuous output;

a platen;

a first clutch engageable to transmit said motor output;

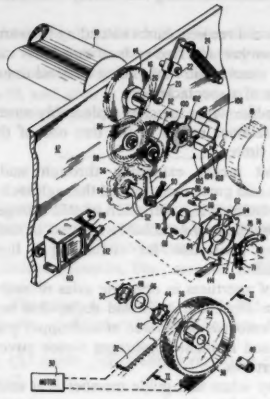
a second clutch driven by said first clutch;

a drive train;

said second clutch engageable to transmit the said output of said motor transmitted by said first clutch to said second clutch to said drive train;

said drive train drivingly engaged with said platen, whereby

the engagement of said clutches connects drivingly said motor to said platen and disengagement of said clutches



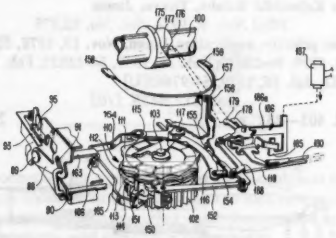
frees said motor from driving engagement with said platen and said platen from connection with said first clutch.

4,347,007

TYPEWRITER CARTRIDGE AND FEED MECHANISM THEREFOR

John O. Schaefer, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 27, 1977, Ser. No. 801,286
Int. Cl.³ B41J *35/28*
U.S. Cl. 400—208 **18 Claims**



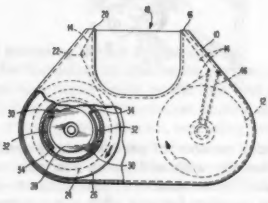
1. A typewriter cartridge and drive mechanism therefor, said cartridge comprising a case having a body portion and having integral spaced apart guide members projecting therefrom for positioning a preselected portion of a typewriter ribbon in a plane at a predetermined location and distance from said body portion; a first spool mounted for rotation within said body portion, having a fixed axis of rotation and for holding a supply of typewriter ribbon, and a second spool spaced from said first spool for receiving said ribbon; said second spool having an axis which is mounted for motion in a predetermined path within said body portion; means defining an opening along the perimeter of said case and in said path; and means to bias said second spool in said path towards and into said opening and against at least a portion of said means defining said opening; said drive mechanism comprising a ribbon advancing means operatively associated with said opening for providing engagement against said ribbon on said second spool and for moving said second spool away from said means defining said opening; means on said cartridge defining a pivot for said cartridge along an axis thereof essentially parallel to said plane, said cartridge being movable between a first home position and a second elevated position about said axis; first and second cam means, said first cam means operable cyclically to elevate said cartridge from said home position to one of a plurality of print positions, and then to bring said cartridge back to its home position; said second cam means including said ribbon advancing means for effecting advancement of said ribbon upon said cartridge being elevated about said pivot.

4,347,008

ANTI-REVERSAL BACKCHECK FOR PRINTER RIBBON CARTRIDGE TAKEUP SPOOL

Peter F. Jagodzinski; Thomas R. Field, and Carl D. Patrick, all of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 27, 1980, Ser. No. 163,656
Int. Cl.³ B41J *35/28*
U.S. Cl. 400—208 **3 Claims**



1. A ribbon cartridge for containing and supporting a printing ribbon comprising,

a cavity having at least a top and bottom surface,

a supply spool mounted within said cavity and comprising a core and a coiled supply of ribbon,

a take-up spool rotationally mounted within said cavity for accumulating ribbon dispensed from said supply spool,

said cavity further comprising aperture means for permitting the passage of said ribbon exteriorally of said cavity, said ribbon attached to said take-up spool,

said take-up spool further comprising outwardly extending arms proximate to one end of said takeup spool, said arms extending substantially concentric with said take-up spool,

and said cavity further comprising a truncated cylindrical surface in one of said top or bottom surfaces, said cylindrical surface being further provided with ratchet teeth about the interior of said cylindrical surface;

said arms of said take-up spool engageable with said ratchet teeth to provide resistance to rotation of said take-up spool in a selected direction of rotation substantially in excess of any resistance to the rotation of said take-up spool in the opposite direction of rotation, said arms being flexible and positioned within and confined by said truncated cylindrical surface and said ratchet teeth thereon, to increase the effective rigidity of said arms in response to attempted rotation in said selected direction of said takeup spool, said ratchet teeth serving as means to limit the bowing of said arms through confined contact between said arms and said ratchet teeth.

4,347,009

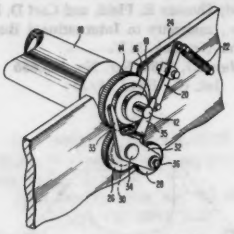
OPERATOR INTERCHANGEABLE GEAR DRIVEN PLATEN AND PLATEN DRIVE MECHANISM FOR TYPEWRITERS AND PRINTERS

Clifford G. Brown, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 16, 1981, Ser. No. 273,556
Int. Cl.³ B41J *19/96*
U.S. Cl. 400—611 **13 Claims**

1. A platen drive apparatus for driving interchangeable platens having differing line feed amounts due to different diameter platen gears comprising:

a drive gear;
an idler gear driven by said drive gear;
an interchangeable plate gear having an axis of rotation and a predetermined number of gear teeth, driveable by said idler gear;
means for effecting automatic adjustment of said idler gear in a gear ratio change in which the number of teeth on a platen gear is subject to change with tooth pitch held constant, said means comprising a constraint member and a support member,



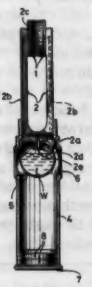
said constraint member of predetermined configuration supported coaxially with said platen gear axis, said configuration dictated by the number of gear teeth on said platen gear;
said support member for said idler gear pivotally supported about said driving gear and engageable with said constraint member to define a spatially confined position of said idler gear in mesh with said platen gear whereby said constraint member associated with said platen gear causes constrained engagement of said idler with said platen gear, thereby facilitating operator exchange of platens, platen gears and constraint members to control the amount of line feed of said gear driven platen.

4,347,010

CLEANING DEVICE FOR EYEGLASSES

Alex Petkoff, No. 131, Hochstädter Landstrasse, 645 Hanau/-Hohe Tanne, Fed. Rep. of Germany

Filed Aug. 13, 1979, Ser. No. 66,139
Int. Cl.³ G02C *11/08*
U.S. Cl. 401—10 **8 Claims**



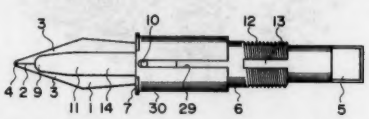
1. A cleaning device for eyeglasses comprising:
(a) an elongated, rigid tubular wall means defining a casing, the opposite top and bottom ends thereof being open, the interior thereof being unobstructed and the interior cross-sectional configuration thereof being substantially uniform between positions adjacent the top and bottom ends thereof;
(b) removable cover means for closing said opposite top and bottom ends;
(c) a guide member substantially conforming to the interior cross-sectional configuration of said casing and longitudinally slidable therein between upper and lower positions in said casing;
(d) a projection extending rearwardly from said guide member;
(e) two spaced resilient limbs extending forwardly from said guide member, the free ends of said limbs each including retainer means, said limbs being adapted to extend around the edge of a spectacle lens;
(f) a spong-like wiper member replaceably mounted on each of said retainer means at the free end of the respective resilient limb;
(g) conduit means extending through said projection, through said guide member and through each of said limbs and communicating with each of said sponge-like wipers;
(h) a collapsible bag detachably secured to said rearwardly extending projection for containing a liquid cleaning agent; and
(i) a pair of apertures in opposite sides of said tubular wall means in alignment with said collapsible bag when said guide member is positioned at said upper position in said casing, and resilient diaphragm means covering each of said apertures;
(j) whereby when said guide member is at said lower position said limbs and wipers are contained within said casing, and when said guide member is in said upper position said limbs extend above said casing in an operative position, and in said latter position said resilient diaphragms may be pressed towards each other to compress opposite sides of said collapsible bag and cause said liquid cleaning agent to be fed through said conduit means to each of said sponge-like wipers when eyeglasses are being cleaned.

4,347,011

FOUNTAIN PEN EQUIPPED WITH A RESILIENCY ADJUSTMENT DEVICE

Seikichi Yanagita, Chigasaki, Japan, assignor to Pilot Man-Nen-Hitsu Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1979, Ser. No. 92,878
Claims priority, application Japan, Nov. 17, 1978, 53-141094; Feb. 28, 1979, 54-22030; Feb. 28, 1979, 54-22031; Feb. 28, 1979, 54-22032; Jul. 16, 1979, 54-97665[U]
Int. Cl.³ B43K *1/02*
U.S. Cl. 401—231 **22 Claims**



1. A fountain pen comprising:
a pen core;
a pen tip having a writing point, said pen tip being operatively mounted on said pen core;
a pen tip mounting portion and an overflow ink containing chamber formed in said pen core;
a pen core cover positioned around a portion of said pen core and sealingly covering at least said pen tip mounting portion and said over-flow ink containing chamber formed in said pen core, said core cover including a guide portion having a guide slot formed at least on a surface of one end portion of said guide portion closer to said writing point in such a manner that said guide slot lies along an axial line of the upper surface of said pen;
a tongue-shaped flexible retaining member having a first end portion contacting said pen tip, a curved portion which is curved towards said point, an air gap formed between said curved portion and said tip, and a straight portion which is not in contact with said tip, said retaining member being positioned in said guide slot so as to be slidable on the outer

surface of said pen core cover and to be slidable with respect to said pen tip;

knob means coupled to an outer surface of said retaining member;

a rotation-type shifting cylinder rotatably mounted around said pen core cover, said shifting cylinder having a spiral groove formed on an inner surface thereof, said knob means being engaged with said groove on said inner surface; and

a holder cylinder to which is detachably mounted said pen core cover.

4,347,012

METHOD AND APPARATUS FOR TENSION SETTING AND COMPRESSION RELEASING TUBULAR CONNECTORS

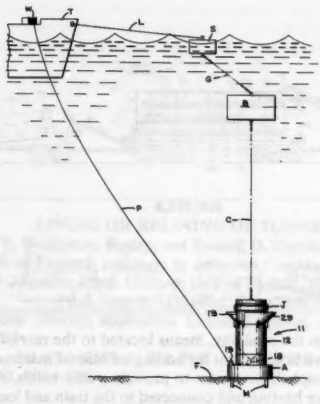
Gregory L. Glidden, Houston, Tex., assignor to FMC Corporation, Chicago, Ill.

Filed Sep. 4, 1979, Ser. No. 71,811

Claims priority, application United Kingdom, Oct. 7, 1978, 39709/78

Int. Cl.³ F16B *1/00*; F16D *9/00*; F16P *5/00*

U.S. Cl. 403—2 **13 Claims**



1. A connector for releasably securing two objects together at a remote location using axial tension to lock two portions of the connector together and using axial compression to unlock the two portions, said connector comprising:

an outer element having an annular passage defined by the inner surface of said outer element, and having an inner groove extending radially outward from the inner surface of said outer element;

an inner element having an annular outer surface to slidably fit inside said passage of said outer element;

a spring means attached to the outer portion of said inner element, said spring means being biased in a radially outward direction from said inner element;

means for compressing said spring means in a radially inward direction to facilitate moving said spring means and said inner element into said passage, said spring means expanding into said inner groove to lock said inner element to said outer element when tension is applied to bias said inner element axially away from said outer element; and

a sloping cam surface adjacent said inner groove in said outer element for compressing said spring means in a radially inward direction to release said inner element from said outer element when the weight of said inner element biases said inner element axially toward said outer element.

4,347,013

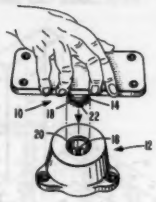
MOUNTING DEPTH-FINDERS, OR FISH FINDERS

William A. Turner, 2704 First St., and Johnny R. Nunnelee, Rte. 1, Box 223 Hillcrest Dr., both of Gadsden, Ala. 35901

Division of Ser. No. 941,650, Sep. 11, 1978, abandoned. This application Dec. 5, 1979, Ser. No. 100,686

Int. Cl.³ F16B *7/00*; F16D *1/10*

U.S. Cl. 403—4 **4 Claims**



1. A swivel mounting device comprising:

a male member including an attachment portion, adapted for attachment to a depth finder or the like, and a stem portion, extending from the attachment portion and having a plurality of first grooves therein, extending longitudinally of the stem portion, and a second groove therein, extending circumferentially around the stem portion between the first grooves and the attachment portion; and

a female member adapted for attachment to a boat or the like and having a recess adapted to receive the male member stem portion and including therein (a) a spring loaded pawl member for engaging one of the male member first grooves while permitting ratcheting rotation between the male member and the female member, and (b) three spring loaded slide members for engaging the male member second groove to releasably retain the male member and the female member together.

4,347,014

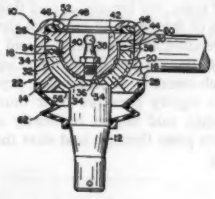
HEMISPHERICAL BALL AND SOCKET JOINT

Joseph E. Smith, Birmingham, Mich., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Jul. 30, 1979, Ser. No. 61,644

Int. Cl.³ F16C *11/06*

U.S. Cl. 403—36 **14 Claims**

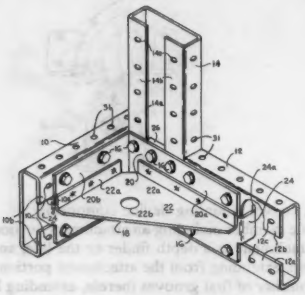


1. A ball joint structure comprising a stud and a half-ball member integrally formed at one end of said stud, a peripheral spherical surface on said half-ball member and a recess in the end of said half-ball member having a concave substantially hemispherical surface, said peripheral spherical surface and said concave hemispherical surface being substantially concentric with each other, a socket member having a concave spherical surface engaged with the peripheral spherical surface of said half-ball member, a cup-shaped retainer member having a substantially hemispherical peripheral surface concentric to and engaged with said concave hemispherical surface in the recess of said half-ball, a grease fitting disposed at the bottom of said cup-shaped retainer member, biasing means urging said concentric spherical surfaces in mutual swiveling sliding engagement, and means holding said biasing means.

4,347,015
STRUCTURAL FRAME CORNER ASSEMBLY FOR ELECTRICAL SWITCHBOARDS AND THE LIKE

William F. Olashaw, Plainville, Conn., assignor to General Electric Company, New York, N.Y.

Filed Nov. 3, 1980, Ser. No. 203,201
Int. Cl.³ F16D 1/00
U.S. Cl. 403—219 8 Claims



1. A structural frame corner assembly for enclosures such as electrical switchboards and the like, said assembly comprising, in combination:

A. an elongated width post, an elongated depth post and an elongated vertical post arranged in mutually perpendicular relationship with a terminal portion of said vertical post disposed in intermediate, abutting relation with terminal portions of said width and depth posts at a corner of the enclosure frame,

(1) each of said posts being C-shaped in cross-section to provide a coextensive slot flanked by flanges having corresponding patterns of holes preformed therein;

B. a sheet metal gusset sub-assembly including

(1) a brace integrally formed having a pair of elongated legs arranged at a right angle;

(2) vertically spaced patterns of preformed holes distributed along the lengths of said legs;

(3) a triangular gusset plate affixed to said legs to reinforce their right angular relationship; and

(4) a finger integrally formed with the free end of each said leg and bent back in directions away from said gusset plate, the lengths of said fingers being slightly in excess of the depth of said post slots; and

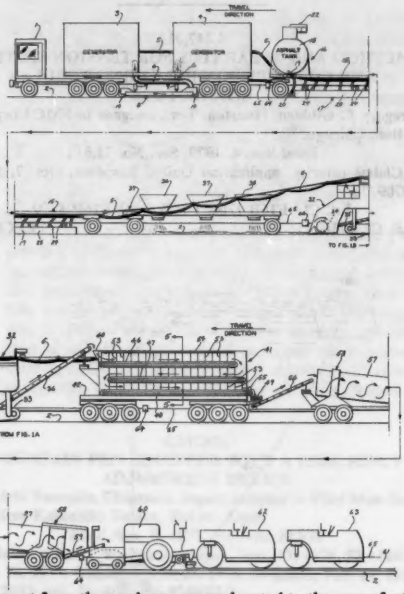
C. self-threading screws utilizing said preformed holes in said post flanges and said brace legs to assemble said gusset sub-assembly to said width, depth and vertical posts and thus rigidly preserve their mutually perpendicular relationship, said fingers resiliently engaging said width and depth posts through said slots therein to tension said assembly.

4,347,016
METHOD AND APPARATUS FOR ASPHALT PAVING

Robert A. Sindelar, 606 E. South St., and Donald J. Alexander, 125 Webster St., both of Beaver Dam, Wis. 53916

Filed Aug. 21, 1980, Ser. No. 180,157
Int. Cl.³ E01C 23/14
U.S. Cl. 404—95 8 Claims

1. An apparatus for asphalt paving, comprising a train having a forward end and a rear end and disposed to move in a forward direction along a roadway having an existing layer of asphalt pavement, an electrical generating unit mounted on the forward portion of the train and operable to burn a fuel and generate electricity, said generating unit having a waste gas discharge conduit for discharging waste gases of combustion, an electric power line connected to the generating unit and extending along the train to transmit electrical power, a pavement pre-heating unit mounted on the train adjacent the generating unit and operably connected to said conduit for discharging said waste gases into contact with said pavement to preheat the same, a first microwave heating unit connected to the train at a location to the rear of said pre-heating unit and operably connected to the power line for generating microwave energy and directing said microwave energy against said pavement to soften the pavement, pavement removing means connected to the train and located to the rear of said first microwave heating unit for removing the pre-heated layer of



pavement from the roadway, means located to the rear of said first microwave heating unit for adding additional materials to the removed asphalt pavement to provide a new batch, a second microwave heating unit connected to the train and located to the rear of said pavement removing means for receiving said batch and generating microwave energy of sufficient intensity to heat the batch and melt the asphalt, and means disposed to the rear of said second microwave heating unit for applying the heated batch onto the roadway as a fresh layer of pavement.

4,347,017
BARRIER BLOCK FOR PROTECTING COASTAL AND RIVERSIDE STRUCTURES

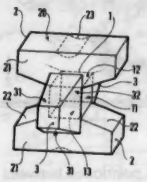
Arnauld Chevallier, Grenoble, France, assignor to Societe Grenobloise d'Etudes et d'Applications Hydrauliques (SOGREAH), Echirolles, France

Filed Feb. 12, 1980, Ser. No. 120,796
Claims priority, application France, Feb. 14, 1979, 79 03774
Int. Cl.³ E02B 3/04
U.S. Cl. 405—29 8 Claims

1. A barrier block for defences protecting coastal and riverside structures, the improvement wherein the block is constituted by a central core of substantially cubic shape having laterally opposed un-hidden side faces and:

firstly top and bottom faces provided with respective top and bottom anvil-shaped legs, the anvil-shaped legs having respective top and bottom surfaces disposed parallel to one another and to said top and bottom faces of the core, the anvil-shaped legs further including inclined flats stemming from said opposite un-hidden side faces of the core; and

secondly opposite front and back faces provided with respective front and back legs in the form of four-sided truncated pyramids, one pair of opposite sides of the pyramid-shaped legs stemming from the sides of the anvil-shaped legs and the



other pair of opposite sides having their bases at least partially in common with one edge of the adjoining un-hidden side faces of the core, such that said one pair of opposite sides of said pyramid-shaped legs overlap and are supported by the sides of said anvil-shaped legs.

4,347,018

LINING OR RELINING OF TUNNELS

Noel T. Wrightson, Rugby, and Russell D. Currie, Shrewsbury, both of England, assignors to Johnston Construction Limited and Johnston Pipes Limited, both of Redhill, England

Filed Aug. 5, 1980, Ser. No. 175,681

Claims priority, application United Kingdom, Aug. 9, 1979, 7927764

Int. Cl.³ E21D *11/00;* F16L *55/18;* B23P *19/04*

U.S. Cl. 405—150 6 Claims

1. A method of lining or relining a tunnel, for example a sewer, comprising the steps of overlapping the edges of a pipe including a single longitudinal split in order to reduce the cross-sectional periphery of the pipe, the pipe being of a material of sufficient pliability to permit the overlapping of its edges without fracture, inserting the pipe with overlapped edges into the tunnel, re-aligning the edges of the pipe and thereby expanding the pipe in the tunnel, securing the edges of the pipe together to retain the pipe in its expanded form, deforming a collar into a shape in which a first dimension of the collar is increased and a second dimension is decreased, inserting the deformed collar into the tunnel with its said first dimension generally along the tunnel, expanding the collar back to its original shape, rotating the collar about an axis generally transverse of the tunnel to locate the collar in the tunnel and engaging the pipe with the collar when expanding the pipe in the tunnel.

4,347,019

COMPOSITE COMPLEX PROFILE AND THE PROCESS FOR ITS MANUFACTURING

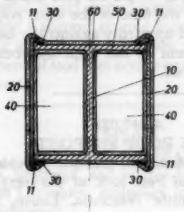
Paul Metz, Luxembourg, Luxembourg, assignor to Arbed S.A., Luxembourg, Luxembourg

Filed Aug. 13, 1980, Ser. No. 177,592

Claims priority, application Luxembourg, Aug. 14, 1979, 81607

Int. Cl.³ E04C *3/34*

U.S. Cl. 405—255 6 Claims



1. A post comprising:

a steel H-beam core formed with a central web and lateral flanges unitary with said web, each of said flanges being formed with an outwardly turned spur along the outer edge of an outer face thereof;

a pair of steel sheets each having inwardly bent edges, each of said sheets bridging two spaced-apart flanges of said H-beam with the inwardly bent edges of said sheets form-fittingly engaged over the spurs of said flanges, said sheets lying parallel to said web and defining a pair of compartments with said web and inner surfaces of said flanges;

an outer layer of colloidal concrete bonded directly to the steel of said sheets and said flanges and completely enveloping same; and

inner layers of colloidal concrete bonded directly to surfaces of said flanges and said sheets defining said compartments and thereby lining same.

4,347,020

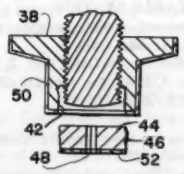
MINE ROOF BOLT ASSEMBLY

Claude C. White, Birmingham, and Frederick Carr, Tuscaloosa, both of Ala., assignors to Birmingham Bolt Company and Jim Walter Resources, Inc., both of Birmingham, Ala.

Filed Jan. 2, 1980, Ser. No. 109,189

Int. Cl.³ E21D *20/02*

U.S. Cl. 405—260 18 Claims



1. A mine roof bolt assembly for insertion in a bore in a mine roof, said roof bolt assembly including

(a) a shank

(b) a first means for anchoring an end of said shank in said mine roof at the back end of the bore

(c) a head member having a bore engaged with the opposite end of said shank

(d) a second means for permitting rotational movement of

said head member with respect to said shank and relative longitudinal movement of the head member with respect to the shank in the direction of the face of the mine roof

(e) a third means within the bore of said head member for limiting relative rotational and longitudinal movement of said head member with respect to said shank

(f) said third means being disengageable from said head member to allow further rotational and longitudinal movement of said head member with respect to said shank, unimpeded travel of said shank through said head member and upward movement of the head member towards the face of the mine roof, and

(g) a fourth means positioned on said shank between said head member and the face of the mine roof, said fourth means being forced upwardly against the face of the mine roof upon movement of the head member towards the face of the mine roof.

4,347,021
MINE ROOF SUPPORTS

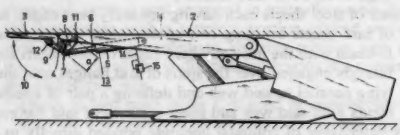
Burckhardt Elsner, Lunen, and Rüdiger Kirchbrücher, Dortmund-Brackel, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed May 8, 1980, Ser. No. 147,896

Claims priority, application Fed. Rep. of Germany, May 8, 1979, 2918411; Oct. 18, 1979, 2942093

Int. Cl.³ E21D *17/054*

U.S. Cl. 405—293 **14 Claims**



1. In or for a mine roof support, a multi-part extendible upper roof contacting structure composed of a main roof-contacting structure, an auxiliary roof-contacting structure pivotably connected to the main structure, an appliance for pivoting the auxiliary structure about the main structure, and linkage means for enabling the appliance to adjust the position of the auxiliary structure between limiting positions aligned with the main structure and stowed beneath the main structure, said appliance comprising a piston and cylinder unit carried by the main structure and disposed therebeneath, and the linkage means comprising a first guide member pivotably connected to the auxiliary structure, a second guide member pivotably connected to the main structure, and means pivotably connecting the guide members to the piston and cylinder unit.

4,347,022
AIR TABLE SYSTEM

Ronald A. Lenhart, Lakewood, Colo., assignor to Precision Metal Fabricators, Inc., Arvada, Colo.

Continuation-in-part of Ser. No. 947,441, Oct. 2, 1978. This application Apr. 7, 1980, Ser. No. 138,006

Int. Cl.³ B65G *51/02*

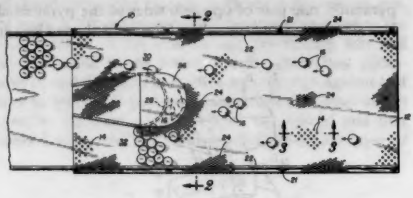
U.S. Cl. 406—88 **8 Claims**

1. An air table apparatus for the transport of objects which comprises:

a table having a surface, edges and an underside with a prearranged pattern of air jet openings in the surface slanted in a downstream direction and communicating the surface and the underside;

a plenum adapted to be connected to a source of air under pressure underlying and attached to the underside of the table surface;

a perforated cover spaced and supported above the table surface a distance slightly greater than the height of an object being worked upon including solid cover portions; and,



a vertical barrier means positioned between the table surface and the cover such that objects moving under the solid cover, separate and pass to either side of the barrier means.

4,347,023
HOLD DOWN SUPPORT SYSTEM

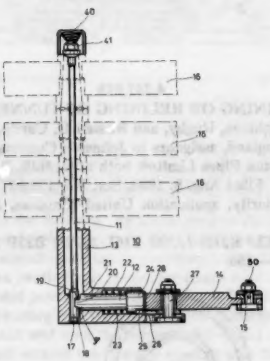
Ioannis Rizos, Hohenbrunn, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany

Filed Dec. 4, 1979, Ser. No. 100,264

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1978, 2853070

Int. Cl.³ B60P *1/64, 7/06;* **B63B** *25/00*

U.S. Cl. 410—32 **15 Claims**



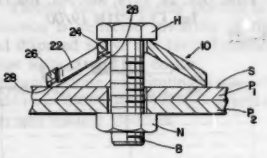
1. System for holding support elements, comprising a hold-down device, said hold-down device including an axially extending pin arranged to support at least one support element, an axially extending locking bolt extending transversely of said pin for securing said pin in the held position, means for biasing said locking bolt out of the position securing said pin in the held position, said biasing means at least in part being introduced into said locking bolt through said pin, blocking means for preventing said locking bolt from being displaced from the position where it secures said pin in the held position, said biasing means comprises a projection extending outwardly from one of said pin and said locking bolt toward the other one of said locking bolt and said pin, a recess formed in the other one of said locking bolt and said pin, said recess having a shape conforming to the shape of said projection and arranged to receive said projection, when said projection is located within said recess each of said projection and recess having a surface in contact with the other said surface with said surfaces extending obliquely of the axial direction of said locking bolt, and means for tensioning said pin so that the interaction of said contacting surfaces biases said locking bolt away from said pin.

4,347,024

TENSION INDICATING AND LOCK CONE WASHER

Chester P. Coldren, Canton, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 22, 1980, Ser. No. 180,289
Int. Cl.³ F16B *43/00*
U.S. Cl. 411—11 4 Claims



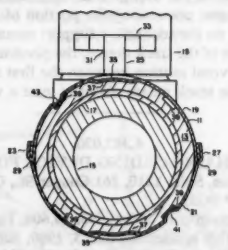
1. A tension indicating the lock cone washer for use in connection with a headed fastener and bearing surface, said washer adapted to be compressed between the head of the headed fastener and the bearing surface to indicate the tension in the headed fastener is within a predetermined range comprising a predetermined minimum and maximum tension, said washer comprising a generally annular body of non-malleable material having a generally centrally located aperture therethrough, said body defined by an inner and an outer diameter, said body of a generally frustoconical shape in cross-section, a generally radially extending through slot extending from adjacent the inner diameter to adjacent the other diameter, at least one web defined by the remaining material aligned with the slot adjacent at least one of the inner and the outer diameter of the body, said web defining remaining material of a cross sectional area, taken on a plane containing the axis of said aperture, selected to result in through cracking of said web defining remaining material when said body is subject to a compression force equal in magnitude to the predetermined minimum tension.

4,347,025

REPLACEABLE FUEL NOZZLE NUT LOCKWASHER

James M. Long, Windsor, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 17, 1980, Ser. No. 187,888
Int. Cl.³ F16B *39/02*; F16L *35/00*
U.S. Cl. 411—201 6 Claims



1. A replaceable fuel nozzle nut lockwasher for securing a fuel nozzle nut to a fuel nozzle comprising, in combination:

a first semicircular shaped member adapted to fit upon the upper portion of said fuel nozzle nut, said first semicircular shaped member having a first tab located at one end thereof, a second tab located at the opposite end thereof, and a third tab located in the center thereof, said third tab adapted to fit within a slot located in said fuel nozzle so as to prevent the rotational movement of said fuel nozzle nut lockwasher about said fuel nozzle nut;

a second semicircular shaped member adapted to fit upon the lower portion of said fuel nozzle nut, said second semicircular shaped member having a pair of apertures, the first of which is adapted to receive the first tab of said first semicircular shaped member, and the second of which is adapted to receive the second tab of said first semicircular shaped member; and

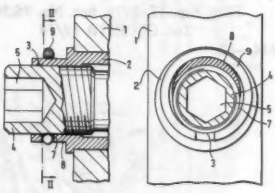
a pair of preformed grooves, the first of which is located in said first semicircular shaped member, and fits within a first groove located in said fuel nozzle nut, and the second of which is located in said second semicircular shaped member, and fits within a second groove located in said fuel nozzle nut, said pair of preformed grooves adapted to prevent the axial movement of said fuel nozzle nut lockwasher upon said fuel nozzle nut.

4,347,026

RETAINING MEANS

Peter Schelhas, Stuttgart, and Walter Schlott, Kernen, both of Fed. Rep. of Germany, assignors to Robert Basch GmbH Stuttgart, Germany

Filed Dec. 3, 1979, Ser. No. 99,436
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1979, 2904537
Int. Cl.³ F16B *39/34*
U.S. Cl. 411—299 5 Claims



1. A retainer for an adjustable element comprising:

a first member of generally cylindrical shape having a longitudinal axis with an opening therethrough along said axis, a circumferentially extending variable depth groove formed in a portion of said first member in a circumferential direction, said groove being formed eccentric to the axis of the opening and with a portion of said groove penetrating into said opening along at least one location thereof;

a second member, supporting in the opening of said first member and being adjustable axially therein with respect to said first member;

ring shaped resilient means arranged in said groove of said first member, said resilient means having a portion thereof extending into said axial opening at said at least one location and in frictional contact with said second member.

4,347,027

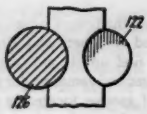
DRILL SCREW

Brian Brindle, Glen Waverley, Australia, assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation of Ser. No. 671,454, Mar. 29, 1976, abandoned.
This application Aug. 3, 1977, Ser. No. 821,365
Int. Cl.³ F16B *25/00*
U.S. Cl. 411—387 1 Claim

1. A drilling and reaming screw for use in fastening two or more juxtaposed workpieces, said screw comprising a drill tip, a shank having a surface defining a first radius, a head, a screw thread on a portion of the length of the shank, and two or more frangible reaming means projecting from a region of the shank intermediate the tip and the thread and pinched from the shank material, said projecting reaming means being integral with the

shank and each including an inner and an outer portion, said inner portion extending radially inwardly from the shank surface to a juncture line which includes upper and lower segments, each segment intersecting the shank surface at an acute angle thereto, said outer portion extending radially beyond the shank surface to a radius at least as great as the crest radius of the thread being thereby operative in workpieces made of



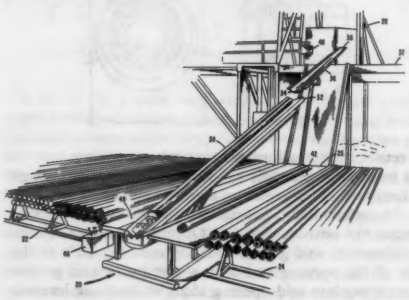
materials of less than a predetermined hardness to form a hole having a radius at least as great as the crest radius of the thread, but being so weakly connected to the shank that the reaming means will be broken and separated from the shank in workpieces formed of materials of more than the predetermined hardness, said separation occurring along a line lying entirely beneath the surface of the shank such that no harmful protuberances remain.

4,347,028

PIPE HANDLING APPARATUS

Charles D. Dugan, Odessa, Tex., assignor to Automatic Pipe Racker, Inc., Odessa, Tex.

Filed Sep. 17, 1979, Ser. No. 76,301
Int. Cl.³ E21B *19/14*
U.S. Cl. 414—22 **12 Claims**



12. In an apparatus for handling tubular goods used in a drilling operation, the apparatus transferring the tubular goods between a storage location and an elevated platform and comprising a support frame located at the storage location, a trough having a first end pivotally connected to the support frame, and lift means for moving the trough between a lowered position in which the trough is positioned to receive goods from the storage location and to transfer goods to the storage location and a raised position in which a second end of the trough is raised so as to permit transfer of goods between the trough and elevated platform, the improvement wherein said lift means comprises:

a first lift device positioned between said support frame and said trough for assisting initial movement of said trough from its lowered position towards its raised position, said first lift device being vertically spaced from said trough when said trough is in the raised position thereof; and

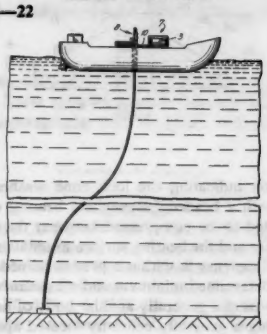
a second lift device interconnected between said support frame and said trough and having an axis skew to the vertical, said second lift device being operable to control movement of said trough between said lowered and said raised positions.

4,347,029

PIPE TRANSFER SYSTEM

John P. Latimer; Robert Donaldson, both of Newport News, Va.; Michael Cross, Everett, Wash.; Harold MacPhaiden, Mercer Island, Wash.; Loren D. Skiles, Everett, Wash.; Henry Schauer, Bothell, Wash., and Thomas J. Reynolds, Lake Stevens, Wash., assignors to Deepsea Ventures, Inc., Gloucester Point, Va.

Filed Dec. 28, 1979, Ser. No. 108,123
Int. Cl.³ E21B *19/00*
U.S. Cl. 414—22 **28 Claims**



1. On a floating surface vessel designed for the dredging of the abyssal ocean depths, the vessel comprising main dredge line hoist means, for supporting a pipeline extending from the vessel to the ocean floor, the dredge line hoist means being pivotally connected to the vessel about at least two transverse axes; and storage means for storing individual pipe lengths on the surface vessel; the improvement comprising:

(a) track means for transporting individual pipe lengths from the storage means to the relatively pivotably movable dredge line hoist means;

(b) primary track support means, secured to the vessel and movably supporting the track means at least at one end thereof, the track means extending in line with one of the transverse axes about which the dredge line hoist means is pivotally connected to the floating surface vessel;

(c) secondary track support means pivotally connected to the vessel about a single axis parallel to the centerline of the track means and to one of the transverse axes about which the dredge line hoist means is pivotally connected to the surface vessel; the secondary track support means being adjacent the dredge line hoist means; and

(d) pivot means, connecting the portion of the track means supported on the secondary support means to the remaining portion of the track means, the pivot means permitting relative pivotal motion between the first and second portions of the track means about at least a vertical axis.

4,347,030

WHEELCHAIR LOADING DEVICE FOR TRAINS

John C. Kingston, Suite 1210, 261 Cooper St., Ottawa, Ontario, Canada (K2P 0G3)

Continuation-in-part of Ser. No. 14,604, Feb. 23, 1979, abandoned. This application Jul. 3, 1980, Ser. No. 165,554
Claims priority, application Canada, Oct. 31, 1978, 315540
Int. Cl.³ B60P *1/48*
U.S. Cl. 414—556 **6 Claims**

1. A device for loading and detraining wheelchair confined passengers at an entrance to a railway coach comprising,

a movable horizontal loading platform and a pair of spaced apart and opposed linkage means arranged on either side of the entrance for pivotally connecting said loading platform to said coach,

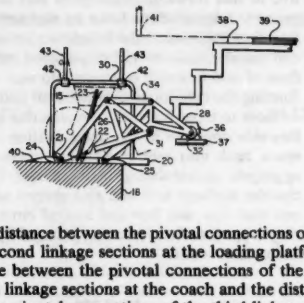
each of said linkage means comprising

three linkage sections which define two co-operating parallelograms, the first and second of said sections each defining a triangular frame and being pivotally connected to said loading platform and said coach and pivotally connected to each other by the third of said linkage sections,

wherein each triangular frame approximates a right angled frame

and wherein the pivotal connections of the first and second linkage sections with the coach are below the coach stairwell and wherein the hypotenuse portion of the second linkage section is deflected inwardly of the triangular frame and disposed above the pivotal connection of the first linkage section with the coach;

said third linkage section constituting a side which is common to said two co-operating parallelograms and which is parallel to said loading platform,



whereby the distance between the pivotal connections of the first and second linkage sections at the loading platform, the distance between the pivotal connections of the first and second linkage sections at the coach and the distance between the pivotal connections of the third linkage section with the first and second linkage sections are all equal

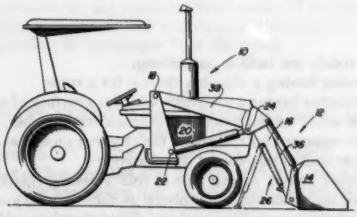
and wherein, when said loading platform is interior of said coach, the pivotal connection of said second linkage section with said loading platform is inboard of the coach relative to the pivotal connection of said first linkage section with said coach, and when said loading platform is exterior of the coach the the pivotal connection of said second linkage section with said loading platform is outboard of the coach relative to the pivotal connection of said first linkage section with said coach.

4,347,031

PARKING STAND FOR TRACTOR-DISMOUNTED FRONT LOADER

Henry Friesen, Niagara Falls, and Mervin P. Kizlyk, Welland, both of Canada, assignors to Deere & Company, Moline, Ill.

Filed Jun. 23, 1980, Ser. No. 161,841
Int. Cl.³ E02F 3/74
U.S. Cl. 414—686 **1 Claim**



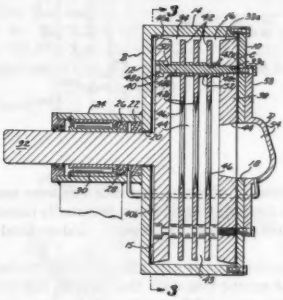
1. In an implement parking stand having an elongated upper member pivoted at its upper end to the implement for swinging toward and away from the implement respectively between transport and park positions, a lower member slidingly interfitting with the upper member and swingable therewith between transport and park positions, and releasable lock means selectively engageable and disengageable between the members for selecting lengthened or shortened conditions thereof, the improvement residing in that the members are of channel cross section so dimensioned that one fits within the other with the open sides of the channels facing in the same direction, the side flanges of the outer of the members being of greater height than those of the inner member, the flanges of the outer member in the areas thereof of greater height having rigid thereon a plurality of lugs spaced lengthwise thereof and extending partly across the inner member sufficiently to overlie the inner member flanges and thus to confine the inner member between the lugs and the bottom of the outer member and said lock means being so constructed as to serve, in the shortened condition of the members, to lock the members to the implement in transport position.

4,347,032

METHOD FOR PUMPING SLURRY AND APPARATUS FOR USE THEREWITH

Clarence R. Possell, 4842 Viane Way, San Diego, Calif. 92110

Continuation-in-part of Ser. No. 858,654, Dec. 8, 1977, abandoned. This application Feb. 19, 1980, Ser. No. 117,641
Int. Cl.³ F04D 7/04
U.S. Cl. 415—90 **9 Claims**



1. A method of pumping a slurry that has a liquid outer phase and an inner phase that includes a plurality of solid particles, said method comprising the steps of:

a. defining a first vertically extending circular confined space between first and second laterally spaced side surface that are connected on their outer peripheral portions by an end surface, said end surface having a discharge opening in the upper portion thereof, said first side surface having a substantially centered inlet opening for said slurry;

b. disposing first and second laterally spaced circular surfaces in said confined space adjacent said first and second side surfaces, said first surface having a centered opening therein axially aligned with said inlet opening and said first and second circular surface having outer peripheral surfaces that taper inwardly towards one another;

c. disposing a plurality of laterally spaced ring-shaped surfaces between said circular surfaces, said ring-shaped surfaces defining a plurality of centered openings that are axially aligned with said inlet opening;

d. discharging said slurry towards said inlet opening;

e. pre-rotating said slurry to a first rate prior to said slurry entering said inlet opening; and

f. concurrently rotating said first and second surfaces and ring-shaped surfaces at a rate greater than that of said pre-rotating slurry entering said confined space, with the rotation of said first and second surface and ring-shaped surfaces relative to said slurry in said confined space shearing boundary layers of said slurry that adhere to said

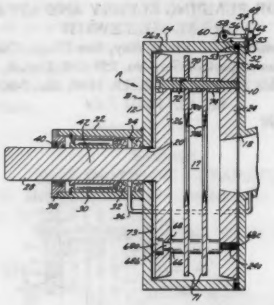
first and second surfaces and ring-shaped surfaces and in so doing importing rotational movement to said slurry in said confined space to cause said slurry to rotate with a desired degree of kinetic energy prior to sequentially flowing through said discharge opening to allow additional pre-rotating slurry to enter said confined space with said pre-rotation minimizing the slippage between said slurry and said first and second surfaces and ring-shaped surfaces, and said taper serving to direct said slurry inwardly towards said ring-shaped surface to have rotational kinetic energy imparted thereto.

4,347,033

CONCRETE PUMP AND METHOD OF USING SAME

Clarence R. Possell, 4842 Viane Way, San Diego, Calif. 92110

Filed Feb. 19, 1980, Ser. No. 117,642
Int. Cl.³ F01D *1/36*; B65G *53/32*
U.S. Cl. 415—90 **13 Claims**



1. A method of pumping flowable concrete containing aggregate to a desired location at a substantially constant rate and with no sharp variation in pressure, said method comprising the steps of:

a. defining a vertically extending circular confined space by first and second side walls that have an end wall extending therebetween, said first side wall having a centered inlet opening therein and said end wall defining a discharge opening;

b. disposing substantially vertical first and second circular surfaces in said confined space in fixed laterally spaced relationship with a plurality of laterally spaced ring-shaped surfaces situated therebetween, said first and second circular surfaces adjacent said first and second side walls, said first surface having a centered opening therein in communication with said inlet opening, and the inner peripheries of said ring-shaped surfaces formed to define circular knife edges;

c. concurrently rotating said first and second circular surfaces and said ring-shaped surfaces;

d. sequentially discharging said flowable concrete into said confined space through said inlet opening as said first and second circular surfaces and ring-shaped surfaces rotate, with boundary layers of said flowable concrete that adhere to said first and second circular surfaces and ring-shaped surfaces being sheared from the balance of said flowable concrete in said confines space with resultant rotation of said flowable cement in said confined space, said flowable concrete after entering said confined space following an outwardly directed spiral path due to the centrifugal force exerted thereon, and the major portion of said aggregate traveling outwardly through the spaces between said ring-shaped discs, with a minor portion of said aggregate of too great size to pass through said spaces pressure contacting said rotating circular knives to be severed into portions sufficiently small as to pass through said spaces, and said flowable concrete including said major portion of said aggregates and said portions thereof moving in stream line flow through said discharge opening;

e. directing said flowable concrete from said discharge opening into an elongate diverging passage in which the walls defining same are at such an angle relative to said center line of said diverging passage that no separation of said flowable concrete from said walls takes place which would result in turbulent flow and joining of said flowable concrete in said passage;

f. directing the discharge of said flowable concrete from said diverging passage into an elongate circular passage defined by a resilient side wall, with said resilient side wall being subject to a minimum of strain due to said flowable concrete traveling through the same at a substantially constant rate and with no sharp variations in pressure;

g. utilizing the rotation of said second circular surface relative to said flowable concrete in said confined space to generate a longitudinal force on said second circular surface that counteracts the imbalance on said first and second circular surfaces and ring-shaped surfaces due to the flow of said flowable concrete into said confined space;

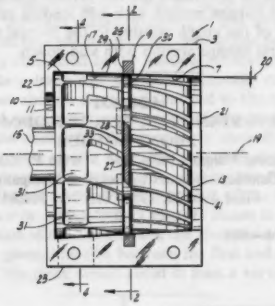
h. forming the exterior edge surfaces of said first and second surfaces to taper inwardly towards one another to direct flowable concrete in the outer portion of said confined space back into said ring-shaped surfaces and prevent aggregate accumulating between said first and second circular surfaces and said ring-shaped surfaces and said end wall that said first and second circular surfaces and ring shaped surfaces become jammed by said aggregate and cannot rotate.

4,347,034

GAS TURBINE

Zoltan Vigh, Anaheim, Calif., assignor to Zepco, Inc., Lincoln, Nebr.

Filed May 29, 1979, Ser. No. 43,320
Int. Cl.³ F01D *1/04*
U.S. Cl. 415—92 **12 Claims**



1. A rotary gas turbine comprising:

a housing having a chamber therein for a rotor;

the chamber having a periphery which is a surface of revolution about an axis extending through the chamber;

a rotor mounted for rotation in the chamber on said axis; and

a stator wall at one end of the chamber;

said rotor having an end face in rotary sealing relationship with said wall and a peripheral surface in rotary sealing relationship with the periphery of said chamber, said rotor further having a plurality of recesses spaced at equal intervals around its periphery, each recess extending radially into said rotor from said peripheral surface thereof and having a passage extending to said end face thereof;

said housing having an inlet for gas under pressure for di-

recting the gas into said recesses in the rotor at an angle for propulsion of the rotor;

said wall being adapted to block each of said passages at said end face of the rotor throughout a part of a revolution of the rotor to hold gas in the recesses for compression and said wall being ported for exit of gas from each recess via the respective passage as the rotor rotates through another part of its revolution for expansion of the gas and resultant impulsing of the rotor, the passage of each recess being closed by the wall for at least a substantial portion of the arc of rotation of the rotor during which the recess receives gas from the inlet and being open during a major portion of the arc of rotation of the rotor during which the recess does not receive gas from the inlet.

4,347,035

CENTRIFUGAL PUMP WITH SINGLE BLADE IMPELLER

Martin Stahle, Postfach 12, CH-8213 Neunkirch, Switzerland

Filed Apr. 13, 1979, Ser. No. 29,650

Claims priority, application Switzerland, Aug. 31, 1978, 918578

Int. Cl.³ F01D *15/00*

U.S. Cl. 415—121 B **11 Claims**

1. A centrifugal pump for pumping fluids containing long-fibered solids, comprising:

a housing having an axial inlet, a tangential outlet and a substantially planar end wall, perpendicular to the axis of the housing, opposite the inlet end thereof,

a single blade impeller mounted to rotate within said housing, said impeller having a substantially cone-shaped hub and a screw blade mounted on said hub, said blade having a radially outer edge having a configuration that upon rotation defines a surface of revolution which flares from the inlet end of said housing towards said end wall to a maximum diameter between said inlet and said end wall and then slopes inwardly towards said end wall; and

cutting means in the area of the intersection of said blade and said end wall for cutting long-fibered solids,

whereby long fibered solids in the fluid handled by said pump which become entangled on said blade slide toward said end wall on the portion of said blade defining the inwardly sloping portion of said surface of revolution and enter the area of said cutting means where they are cut and then be discharged from the pump.

4,347,036

FLUID ENERGY CONVERTING METHOD AND APPARATUS

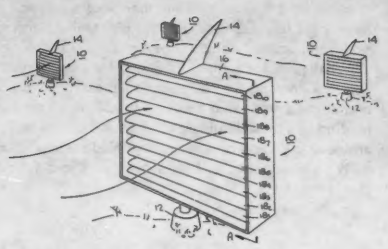
Lee Arnold, 177 E. 77th St., New York, N.Y. 10021

Division of Ser. No. 884,816, Mar. 9, 1978, Pat. No. 4,184,805. This application Nov. 16, 1979, Ser. No. 94,790

Int. Cl.³ F03D *5/06*

U.S. Cl. 416—1 **39 Claims**

1. A method for converting the kinetic energy of a fluid stream into useful work comprising the steps of positioning a device including a cascade of thin airfoils in a moving fluid stream to define an aerodynamic system wherein the airfoils are at zero angle of attack when undisturbed and are provided with at least two degrees of freedom and wherein adjacent airfoils are movable out of phase, adjusting the system until the velocity of the fluid stream is a critical velocity for the system



sufficient to induce flutter oscillations, disturbing at least one of the airfoils, and then utilizing the resultant oscillations to produce useful work.

4,347,037

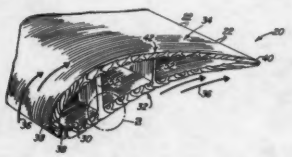
LAMINATED AIRFOIL AND METHOD FOR TURBOMACHINERY

Charles E. Corrigan, Tempe, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 9,201, Feb. 5, 1979, which is a division of Ser. No. 789,371, Apr. 20, 1977, Pat. No. 4,221,539. This application Oct. 14, 1980, Ser. No. 195,896

Int. Cl.³ F01D *5/18*

U.S. Cl. 416—97 A **1 Claim**



1. A cooled, rotary turbine blade for use in turbomachinery comprising a plurality of thin, radially extending laminae stacked generally in a chordwise direction and bonded together to form the major portion of said turbine blade including external pressure and suction surfaces thereof adapted to be arranged in momentum exchange relationship with fluid flow of the turbomachinery, each lamina comprising:

a peripheral wall closing the radially outer end of said lamina and forming segments of said external pressure and suction surfaces, said peripheral wall surrounding a relatively large central cavity open at the radially inner end of said lamina for receiving cooling fluid flow, said peripheral wall further defining a fir tree configured root section adjacent said radially inner end adapted to be secured to a turbine wheel hub of said turbomachinery;

an inner wall spaced closely inwardly of said peripheral wall and extending radially along generally parallel to both said segments of the external pressure and suction surfaces to define a narrow, radially elongated impingement zone of said central cavity disposed between said peripheral and inner walls, said inner wall extending around to close the radially outer end of said central cavity;

support strut means extending radially between and interconnecting the radially outer end portions of said peripheral and inner walls;

a plurality of recesses in said inner wall extending generally perpendicularly thereto whereby cooling flow from said central cavity passes through said recesses into said im-

pingement zone to impinge substantially perpendicularly upon the inner face of said peripheral wall;

protrusions on said inner face of the peripheral wall generally aligned with said recesses to promote turbulence of cooling fluid flow in said impingement zone; and

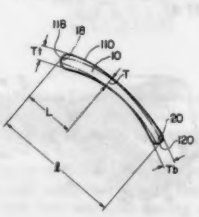
exhaust port recesses in said peripheral wall extending from said impingement zone to open onto said segments of the external pressure and suction surfaces, said exhaust port recesses opening into said impingement zone at locations non-aligned with said recesses in the inner wall and extending in a radially outward direction within said peripheral wall whereby rotation of said blade assists in centrifugally pumping cooling fluid flow out of said exhaust port recesses.

4,347,038

FLEXIBLE BLADE FAN

Masaharu Hayashi, Toyota, and Sunzo Tsuchikawa, Ichinomiya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 14, 1980, Ser. No. 139,749
Claims priority, application Japan, Apr. 20, 1979, 54-48819
Int. Cl.³ F04D *29/38*
U.S. Cl. 416—132 A **2 Claims**



1. A multiblade fan of plastics comprising:

a central hub and a plurality of blades radially extending from said hub, each blade being flexibly integral with said hub, at least one of said blades having a contour of a transverse cross section through a region neighboring the foot of said blade, said contour of said blade being provided under a condition in which a rate of continuous thickness change between a middle point and the leading edge in said transverse cross section is regulated relative to a thickness T of said middle point so that the ratio of a thickness Tf of said leading edge divided by the thickness T of said middle point falls within a range of from 1.0 to 1.5 while another rate of continuous thickness change between said middle point and the trailing edge in the same transverse cross section is regulated relative to the thickness T of said middle point so that the ratio of a thickness Tb of said trailing edge divided by the thickness T of said middle point falls within a range of from 0.7 to 1.2, said middle point being located in said transverse cross section inwardly from said leading edge at a distance L given by multiplying the entire length l of said transverse cross section by 0.4 to 0.6 wherein, said region of said blade is limited in area so that the following holds,

$$Se=S \text{ (0.2 to 0.6)}$$

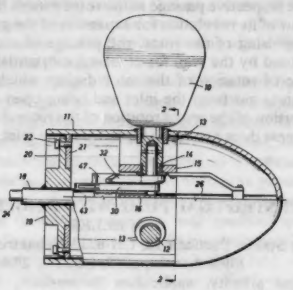
where, Se is a length of said region and S is an entire length of said blade.

4,347,039

VARIABLE PITCH SCREW PROPELLER

Ronald Houghton, 16902 David Glen, Friendswood, Tex. 77546

Filed Feb. 25, 1980, Ser. No. 124,587
Int. Cl.³ B63H *3/04*
U.S. Cl. 416—167 **5 Claims**



1. A variable pitch screw propeller, including a hollow hub, a plurality of propeller blades, each blade attached to a blade shaft that extends through and is mounted in bearings in the hub wall with the propeller blade extending laterally of the hub for rotation with the hub and around the longitudinal axis of the blade shaft, a hollow drive shaft connected to the hub, a pitch control rod extending into the hub, means mounting the pitch control rod for movement along the longitudinal axis of the hub, means connecting the control rod with each blade shaft for rotation of the blade shafts in unison to change the pitch of the propeller blades as the control rod is moved axially relative to the hub through a sufficient angle of rotation to move the blades from a minimum drag feathered position in-line with the direction of movement of the hub to positions for providing forward thrust, no thrust, and rearward thrust upon rotation of the hub, said connecting means including a crank arm connected to each blade shaft for rotating the shafts around their longitudinal axes, a telescoping drive arm having one end pivotally connected to the hub and one end pivotally connected to the control arm, and a drive pin connected to one of the arms and engaging a slot in the other arm to cause the crank arm to rotate as the control rod is moved along its longitudinal axis.

4,347,040

BLADE TO BLADE VIBRATION DAMPER

John C. Jones, Palm Beach Gardens; Perry P. Sifford, Jupiter, and Joel F. Sutton, Juno Isles, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 2, 1980, Ser. No. 193,514
Int. Cl.³ F01D *5/10*
U.S. Cl. 416—190 **8 Claims**

1. In a rotor assembly of the axial flow rotary machine type in which a plurality of individually mounted blades, each having a platform section, extend outwardly on the machine, the improvement comprising:

a blade to blade damper adapted to seat against a pair of

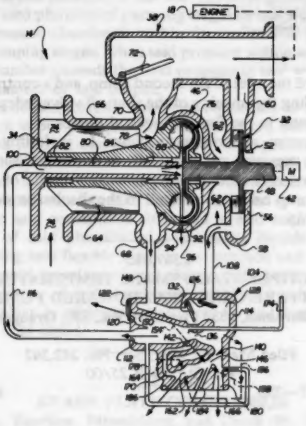
adjacent blade platform sections in response to centrifugally generated loads in an operating engine and of essentially "T" shaped cross section geometry including a top bar and a web extending circumferentially with respect to the machine between said pair of adjacent blade platform sections wherein the top bar provides longitudinal stiffness in the direction of expected slip load forces and the web provides transverse stiffness in the direction normal to the expected slip load forces.

4,347,041

FUEL SUPPLY APPARATUS

Paul Cooper, Titusville, N.J., assignor to TRW Inc., Cleveland, Ohio

Filed Jul. 12, 1979, Ser. No. 56,908
Int. Cl.³ F04B 23/04, 49/08
U.S. Cl. 417—15 13 Claims



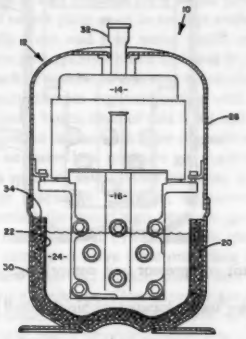
1. An apparatus for supplying fuel to an engine, said apparatus comprising tank means for holding a body of liquid fuel which is supplied to the engine during operation of the engine, first pump means submerged in the body of liquid fuel in said tank means for pumping fuel from said tank means, motor means submerged in the body of liquid fuel in said tank means for driving said first pump means, fluid coupling means submerged in the body of fuel in said tank means and connected with said motor means and said first pump means for transmitting drive forces from said motor means to said first pump means, said fluid coupling means including an input member connectd with said motor means, an output member connected with said first pump means, and chamber means for holding fuel which transmits drive forces from said input member to said output member during operation of said motor means, and control means submerged in the body of fuel for effecting operation of said fluid coupling means between an engaged condition in which said fluid coupling means is effective to transmit drive forces between said motor means and said first pump means and a disengaged condition in which said coupling means is ineffective to transmit drive forces from said motor means to said first pump means, said control means including means for directing a flow of fuel from the body of fuel to said chamber means during operation of said coupling means from the disengaged condition to the engaged condition and for directing a flow of a gas from outside of the body of fuel to said chamber means during operation of said coupling means from the engaged condition to the disengaged condition.

4,347,042

MOTOR COMPRESSOR UNIT AND A METHOD OF REDUCING NOISE TRANSMITTED THEREFROM

Timothy M. Holdsworth, Chittenango, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jun. 2, 1980, Ser. No. 155,870
Int. Cl.³ F04B 39/00
U.S. Cl. 417—53 6 Claims



1. A motor compressor unit comprising:
a shell;
compressor means located within the shell for compressing a vapor;
motor means located within the shell for driving the compressor means;
a supply of lubricant disposed within the shell;
a lubricant absorbent, fibrous material positioned against interior surfaces of the shell for dampening sound waves generated within the motor compressor unit, extending above the lubricant supply, and including an edge exposed to vapor within the shell, wherein lubricant entrained in vapor inside the shell flows onto said exposed edge and therefrom migrates throughout the lining; and
a cover positioned between the lubricant supply and the fibrous material for separating the fibrous material from the lubricant supply and preventing contamination thereof by the fibrous material.

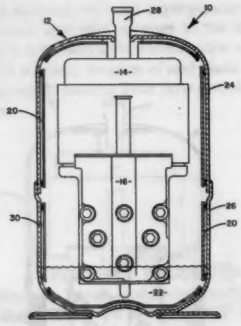
5. A method of reducing noise transmitted from a motor compressor unit of the type having a shell, a lubricant supply disposed therein, a lubricant absorbent, fibrous material positioned against interior surfaces of the shell, and a cover separating the lubricant absorbent material from the lubricant supply, the method comprising the steps of:
wetting the lubricant absorbent material with lubricant;
drawing lubricant throughout the lubricant absorbent material, wherein the lubricant absorbent material becomes resilient; and
conducting energy in sound waves generated within the motor compressor unit through the cover to compress the lubricant absorbent material between the shell and the cover and to transform energy in the sound waves into potential energy of the lubricant absorbent material, dampening the sound waves generated within the motor compressor unit.

4,347,043

MOTOR COMPRESSOR UNIT AND A METHOD OF DAMPENING SOUND WAVES GENERATED THEREIN

Richard D. Morris, Liverpool, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jun. 2, 1980, Ser. No. 155,871
Int. Cl.³ F04B 39/00
U.S. Cl. 417—53 10 Claims



1. A motor compressor unit comprising:
a shell;
compressor means located within the shell for compressing a vapor;
motor means located within the shell for driving the compressor means;
a supply of lubricant disposed within the shell; and
a resilient lining positioned adjacent to the shell, annularly extending around the compressor means, and defining a plurality of perforations extending through the lining to conduct lubricant entrained in vapor within the shell through the lining and between the shell and the lining to capture a thin, annular film of lubricant therebetween.

6. A method for dampening sound waves generated within a motor compressor unit having a shell, a supply of lubricant disposed therewithin, compressor means located within the shell, and a lining extending around the compressor means, positioned adjacent to the shell, and defining a plurality of perforations extending through the lining, the method comprising the steps of:
conducting lubricant through the lining perforations and between the shell and the lining to capture a thin, annular film of lubricant extending around the compressor means; and
transforming energy contained within the generated sound waves into lateral motion of the lubricant.

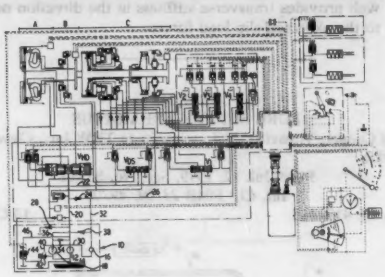
4,347,044

PUMPS

Karl G. Ahlen, Bromma, and Nils A. Norberg, Stockholm, both of Sweden, assignors to S.R.M. Hydromekanik Aktiebolag, Sweden

Filed Aug. 15, 1979, Ser. No. 66,536
Claims priority, application United Kingdom, Aug. 18, 1978, 33809/78; Nov. 21, 1978, 45432/78; Fed. Rep. of Germany, Dec. 20, 1978, 2855085
Int. Cl.³ F04B 49/00
U.S. Cl. 417—253 30 Claims

1. A system for providing pressurized fluid comprising a first pump an a second pump, said first pump having means for supplying pressurized fluid continuously, said second pump connected to the discharge side of the first pump via a non-return valve when the outlet pressure of the second pump exceeds by a predetermined amount the outlet pressure of the first pump, a by-pass connecting channel from the outlet side of the second pump to the inlet side of the second pump, and a selectively operable shut-off valve in said by-pass connecting channel arranged such that when the shut-off valve of the by-pass connecting channel is open, fluid from the second pump does not supply fluid to the outlet of the first pump, said by-pass channel and the maximum opening of the shut-off valve each having a flow cross-sectional area at least as great as the delivery flow cross-sectional area of the second pump, said shut-off valve being a disc valve which closes upon movement toward the inlet of the second pump, and a control device for controlling the opening of the shut-off valve independently of the pressure in the first and second pumps.



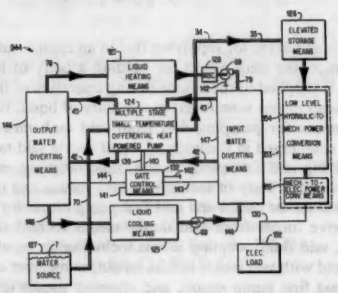
5. A system according to claim 1, including an auxiliary high pressure pump having an outlet pressure greater than the first and second pumps, the inlet side of the high pressure pump being connected to the discharge side of the second pump.

4,347,045

MULTIPLE-STAGE SMALL TEMPERATURE DIFFERENTIAL HEAT-POWERED PUMP

Francis L. Burnham, 1333 Five Chop Rd., SE., Orangeburg, S.C. 29115

Filed Mar. 10, 1981, Ser. No. 242,242
Int. Cl.³ F04B 25/00
U.S. Cl. 417—253 16 Claims


ELEVATED STORAGE MEANS
LIQUID HEATING MEANS
MULTIPLE STAGE SMALL TEMPERATURE DIFFERENTIAL HEAT POWERED PUMP
OUTPUT WATER DIVERTING MEANS
INPUT WATER DIVERTING MEANS
GATE CONTROL MEANS
LIQUID COOLING MEANS
WATER SOURCE
ELEC LOAD
LOW LEVEL HYDRAULIC-TO-MECH POWER CONVERSION MEANS
HIGH LEVEL HYDRAULIC-TO-ELEC POWER CONV MEANS

1. A pump system for pumping a first liquid from a source to an output facility comprising:
a. a multiple-stage small temperature differential heat-powered pump;
b. a second liquid heating means operable to heat a second liquid to a hot temperature, where it becomes a hot liquid which is divertable into said multiple-stage small temperature differential heat-powered pump;
c. a third liquid cooling means operable to cool a third liquid to a cold temperature where it becomes a cold liquid which is divertable into said multiple-stage small temperature differential heat-powered pump;
d. a liquid diverting means within which said hot liquid and said cold liquid are pumped, said liquid diverting means controls the flow of said hot liquid and said cold liquid

into said multiple-stage small temperature differential heat-powered pump;

e. a plurality of troughs within which said input liquid diverting means diverts said hot liquid and said cold liquid;

f. said multiple-stage small temperature differential heat-powered pump comprising:

(1) a plurality of pumping stages; and

(2) a plurality of check valves, one of said plurality of check valves being located on the input and output of said multiple-stage small temperature differential heat-powered pump and between each of said plurality of pumping stages;

g. each of said plurality of pumping stages comprising:

(1) a pressure chamber operable to hold said first liquid; and

(2) a flexible member within said pressure chamber operable, when expanded, to exert pressure against said first liquid and to force said first liquid from said pressure chamber through the one of said plurality of check valves between said pressure chamber and the next pressure chamber of the next subsequent pumping stage of said plurality of pumping stages or said output, if said pressure chamber is within the last of said plurality of pumping stages, when said pressure within said pressure chamber exceeds the next pressure in said next pressure chamber or said output;

h. each of said flexible members, connected to a container which is one of a plurality of containers, each said container holding one of a plurality of vaporizable liquids, whereby when said container is subjected to said hot liquid, said one of said plurality of vaporizable liquids vaporizes causing said flexible member to expand and, when said container is subjected to said cold liquid, said one of said plurality of vaporizable liquids condenses causing said flexible member to contract; and

i. each said container of said plurality of containers secured within one of said plurality of troughs whereby each said container is subjected alternately to said hot liquid and said cold liquid.

4,347,046

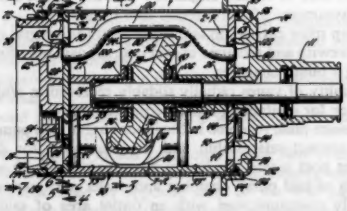
SWASH PLATE COMPRESSOR

Byron L. Brucken, Miamisburg, and Frank W. Hodits, Jr., Kettering, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 966,067, Dec. 4, 1978, abandoned. This application Sep. 12, 1980, Ser. No. 186,749

Int. Cl.³ F04B *1/16, 1/18, 39/16*

U.S. Cl. 417—269 **7 Claims**



1. A swash plate compressor, comprising: a cylindrical shell surrounding front and rear cylinder heads disposed at opposite ends of said shell, said rear cylinder head having a suction inlet and a discharge outlet, a cylinder block disposed intermediate said heads within said shell, said cylinder block including three longitudinally disposed tubular portions arranged about the shell axis and configured to provide open space between adjacent pairs of said tubular portions to reduce the weight of said cylinder block and with an upper two of the tubular portions above the third to form with said shell a low pressure gas upper inlet channel and a pair of low pressure gas lower exit channels, said tubular portions defining front and rear cylinder bores on opposite sides of an inwardly-facing notched-out opening and front and rear hubs respectively, between said front and rear cylinder bores and in communication with said upper inlet channel, whereby to define by said notched-out opening a location for a swash-plate and by said hubs a location for journal means, journal means in said hubs, a compressor drive shaft rotatably supported by said journal means; a swash plate rotatable by said drive shaft in said location for a swash plate, piston means arranged to reciprocate within said cylinder bores in response to rotation of said swash plate, front and rear thrust bearings in said location for a swash plate between each hub and said swash plate so as to restrict endwise movement of said shaft, front and rear valve plates respectively interposed between said cylinder block and said front and rear cylinder heads, each of said front and rear valve plates having inlet and outlet ports therein communicating with associated front and rear cylinder bores, each of said front and rear cylinder heads configured to define with their respective front and rear valve plates an outer low pressure gas suction chamber opposite the open space of said tubular portions and an inner high pressure gas discharge chamber, cross-over passage means interconnecting the inner high pressure gas discharge chambers of said front and rear cylinder heads, means in said rear head and its associated valve plate providing direct axial flow communication from said suction inlet to said upper inlet channel for receiving a mixture of low pressure gas and oil into said upper inlet channel, means in said front and rear heads and their associated valve plates providing axial flow communication from said upper inlet channel to said outer low pressure gas suction chambers via said location for a swash plate and each of said lower exit channels for introduction of a low pressure gas and oil mixture into said cylinder bores, whereby low pressure gas and oil mixture, upon entering said upper inlet channel, flows in heat exchange relation with said upper two of the tubular portions to increase the temperature of said mixture sufficiently to separate a portion of the oil from the gas and deposit the oil portion by gravity on said upper two of the tubular portions for subsequent gravitational flow to the journal means in said hubs by way of the communication of said inlet channel with said hubs to lubricate said front and rear journal means and thrust bearings, and whereby the oil remaining in said mixture after said separation is caused by the flow of said gas to exit said upper inlet channel via the location for said swash plate so that sufficient of the remaining oil admixed with said gas impinges upon and wets the surfaces of said swash plate to lubricate same during reciprocation of said piston means.

4,347,047

HYDRAULIC PUMP FOR POWER STEERING

Shookichi Shiozawa; Tomomi Nakayama, both of Susono; Kyosuke Haga, Anjo; Ryutaro Abe, Toyokawa, and Yoshiyuki Takeuchi, Gamagori, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Aug. 14, 1980, Ser. No. 177,911

Claims priority, application Japan, Aug. 16, 1979, 54/103529

Int. Cl.³ F04B *49/02, 49/08*

U.S. Cl. 417—310 **3 Claims**

1. A hydraulic pump for use in a power steering apparatus comprising:

a pump housing having an intake hole and a discharge port;

a cam ring received in said pump housing and having an internal cam bore;

a drive shaft rotatably carried by said pump housing and extending into said internal cam bore in coaxial alignment with the axis of the center of symmetry of said internal cam bore;

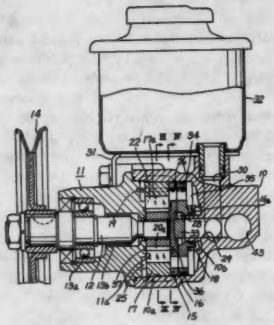
a pump rotor carried on said drive shaft for integral rotation

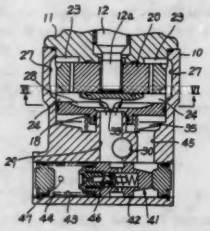
therewith and received in said internal cam bore for defining a pump chamber;

a pressure plate received in said pump housing in contact relationship with said cam ring for defining inlet port means fluidically communicated with an inlet area of said pump chamber and outlet port means fluidically communicated with an outlet area of said pump chamber;

a subplate received in said pump housing in contact relationship with said pressure plate for defining at a contact portion with said pressure plate a low pressure passage extending in a diametral direction and communicated with said inlet port means;

said pump housing being formed with a low pressure hole in coaxial relationship with said internal cam bore and communicated at one end thereof with said low pressure passage and at the other end thereof with said intake hole;





a pressure chamber between said subplate and said pump housing wherein said pressure chamber is fluidically communicated with said outlet port means of said pressure plate through said subplate;

a throttle element disposed on said discharge port through which pressurized fluid from said pressure chamber is discharged;

a flow volume control valve responsive to the pressure difference across said throttle element for returning a part of pressurized fluid through said low pressure hole and said low pressure passage; and

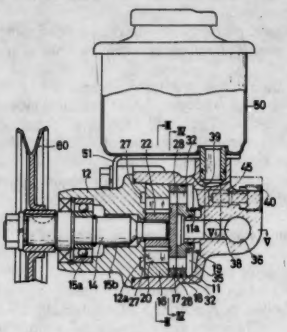
a branch member for branching the flow of fluid flowing in said low pressure hole in the axial direction into the the flow flowing along said low pressure passage in the radial direction.

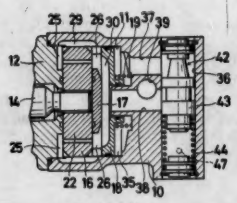
4,347,048

HYDRAULIC PUMP FOR POWER STEERING

Minoru Kawabata; Susumu Honaga, both of Aichi, and Yoshiharu Inaguma, Nagoya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 15, 1980, Ser. No. 186,843
Claims priority, application Japan, Sep. 26, 1979, 54/124982
Int. Cl.³ F04B 49/02, 49/08
U.S. Cl. 417—310 2 Claims





1. A hydraulic pump for use in a power steering apparatus comprising:

a pump body having an inner bore;

a support member fixedly inserted into one open end of said inner bore of said pump body so as to constitute a pump housing;

a cam ring received in said inner bore in contact relationship with one side wall of said support member and having an internal cam bore;

a drive shaft rotatably carried by said support member through a pair of bearings and extending into said internal cam bore in coaxial alignment with the axis of the center of symmetry of said internal cam bore;

a pump rotor carried on said drive shaft for integral rotation therewith and received in said internal cam bore for defining a pump chamber;

a plurality of vanes radially slidably received in said pump rotor for contacting said internal cam bore;

a pressure plate received in the inner bore of said pump body in contact relationship with said cam ring for defining inlet port means fluidically communicated with an inlet area of said pump chamber and outlet port means fluidically communicated with an outlet area of said pump chamber;

a subplate received in the inner bore of said pump body in contact relationship with said pressure plate for defining at a contact portion with said pressure plate a low pressure passage extending in a radial direction and communicated with said inlet port means;

said pump body being formed with a low pressure hole in coaxial relationship with said internal cam bore and communicated at one end thereof with said low pressure passage;

said pump body being formed with a vertical intake hole

communicated with the intermediate of said low pressure hole;

a pressure chamber between said subplate and said pump housing wherein said pressure chamber is fluidically communicated with said outlet port means of said pressure plate through said subplate;

a spring interposed within said pressure chamber for urging said subplate, pressure plate and cam ring toward the one side wall of said support member;

said pump body being formed with a discharge passage in parallel relationship with said low pressure hole and communicated at one end thereof with said pressure chamber and at the other end thereof with said power steering apparatus;

said pump body being formed with a horizontal valve bore in perpendicular relationship and communicated with said low pressure hole;

said pump body being formed with an outlet passage in parallel relationship with said low pressure hole and communicated at one end thereof with said pressure chamber and at the other end thereof with said valve bore;

a throttle element disposed on said discharge passage through which pressurized fluid from said pressure chamber is discharged to said power steering apparatus; and

a flow volume control valve slidably received in said valve bore and responsive to the pressure difference across said throttle element for returning a part of pressurized fluid through said outlet passage, valve bore, low pressure hole and low pressure passage.

4,347,049

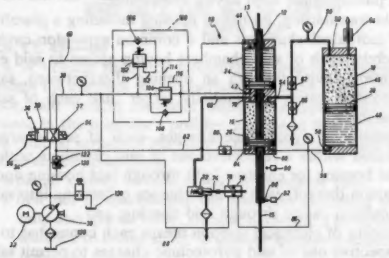
BALANCE HYDRAULIC PUMPING UNIT

John M. Anderson, P.O. Box 5202, Corpus Christi, Tex. 78405

Filed Jun. 17, 1980, Ser. No. 160,347

Int. Cl.³ F04B *47/12, 47/14*

U.S. Cl. 417—403 **3 Claims**



1. A balance hydraulic well pumping unit comprising,

a working rod passing through first and second vertically positioned cylinders,

a first piston positioned in the first cylinder and connected to the rod,

a second piston positioned in the second cylinder and connected to the rod,

hydraulic power means connected to the first cylinder on both sides of the first piston for alternately supplying hydraulic fluid to opposite sides of the first piston for moving the working rod upwardly and downwardly;

an accumulator,

a first fluid connection between one end of the accumulator and the second cylinder at a point above the second piston,

a second fluid connection between the second end of the accumulator and the second cylinder at a point below the second piston whereby movement of the first piston downwardly actuates the second piston to store energy in the accumulator for assisting the movement of the working rod upwardly on the upward stroke of the pumping unit,

said fluid in the second cylinder above the second piston is air and the first fluid connection includes,

a first check valve allowing fluid flow from the second cylinder to the accumulator,

a second check valve connected to the second cylinder above the second piston allowing flow of air from the atmosphere into the second cylinder,

a relief valve connected to the one end of the accumulator, and

a relief valve connected to the second cylinder above the second piston allowing air at a predetermined pressure to flow from the second cylinder.

4,347,050

EXTRUSION VESSEL WITH CONTROLLED CIRCULAR DISTRIBUTION OF THE EXTRUDED MATERIAL

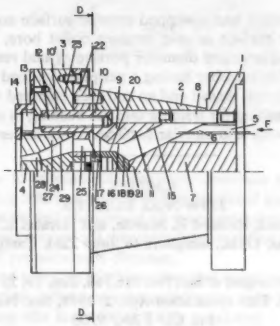
Blaise F. Figuereo, 344, rue Paul Doumer, 78510 Triel sur Seine (Yvelines), France

Filed Dec. 19, 1980, Ser. No. 218,103

Claims priority, application France, Dec. 19, 1979, 79 31048; Nov. 21, 1980, 80 24721

Int. Cl.³ B29F *3/04*

U.S. Cl. 425—72 R **8 Claims**



1. An extrusion vessel for the controlled distribution of extruded material in combination with a die mounted at the exit of an extruder comprising a base plate (1), said base plate comprising one set of orifices (5) disposed therein, said orifices of said one set being disposed substantially in a circular pattern and substantially equidistant from each other, a frustum (7) secured to said base plate (1), said frustum (7) comprising a second set of orifices (6) aligned respectively with and in extension of said first set of orifices (5), distributors (9) aligned respectively with said second set of orifices (6), said distributors (9) being substantially parallel to the longitudinal axis of said vessel and respectively moveable in the direction of said base plate (1) to reduce the passage between the corresponding lateral surface of said frustums (7) and moveable in the opposite direction toward said die to achieve a passage equal to or greater than a cross-section equivalent to that of the corresponding one of said second set of orifices (6), and said distributors (9) comprising respectively projections (11) extending toward the center of said vessel.

4,347,051

DIE AND PUNCH ASSEMBLY FOR COMPACTING POWDER MATERIAL

Raymond P. DeSantis, Royal Oak, Mich., assignor to PTX-Dentronix, Inc., Lincoln Park, Mich.

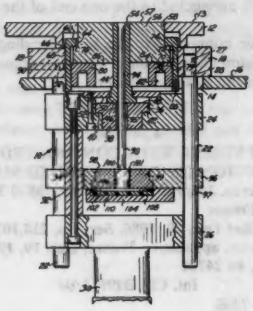
Filed Sep. 17, 1979, Ser. No. 76,366

Int. Cl.² B30B *11/02*

U.S. Cl. 425—78 **11 Claims**

1. In a unitary punch and die assembly for mounting on a powder compacting press, said assembly comprising a die plate, a bore in said die plate and a removable die bushing

disposed in said bore, a die bushing retainer collet in the form of a cylindrical sleeve member provided with a peripheral thread engageable with an internal thread formed in the bore in said die plate, a bore in said retainer collet having an enlarged diameter portion defining a stepped annular surface, said die bushing having a conforming configuration with a reduced



diameter portion and a stepped annular surface engaged with said annular surface in said retainer collet bore, an internal thread in said enlarged diameter portion of said retainer collet bore and a ring member having a peripheral thread engageable with said internal thread and an end face engaged with an end of said die bushing for holding said die bushing in said retainer collet bore with said annular surfaces in mutual engagement.

4,347,052

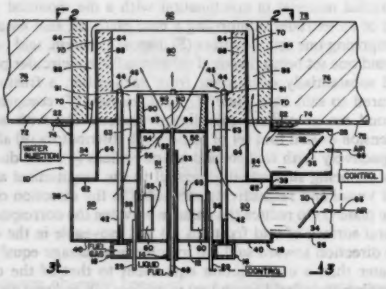
LOW NOX BURNER

Robert D. Reed; Richard R. Martin, and Hershel E. Goodnight, all of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Continuation-in-part of Ser. No. 916,766, Jun. 19, 1978, Pat. No. 4,257,763. This application Apr. 2, 1979, Ser. No. 26,325

Int. Cl.³ F23Q *9/00*

U.S. Cl. 431—188 **4 Claims**



1. In a fluid fuel burner positioned in a furnace opening for minimum production of NOx burner under variable rates of fuel supply having a refractory lined first combustion space with an opening thereto which contains a centrally located pre-combustion space opening into said first combustion space and having a liquid fuel nozzle therein; a plurality of coaxially located gaseous fuel nozzles for directing gaseous fuel from a gaseous fuel source into said first combustion space, a primary combustion air chamber surrounding said liquid fuel nozzle for introduction of primary combustion air into said pre-combustion chamber, means to supply secondary air into a first annular space formed between the opening in said first combustion space and said pre-combustion space, the total of said primary and secondary air being supplied from a single controllable source and thence divided into said primary and secondary portions, a second annulus between said first combustion space and said furnace opening to supply tertiary air from a separate controllable source to immediately downstream of said first combustion space and means to ignite the resulting combustion fuel-air mixture, the improvement comprising means to control the amount of primary air into said pre-combustion chamber and means to simultaneously control the single controllable source of said primary-secondary air and the separate controllable source of said tertiary air whereby the total of said primary-secondary air in the first space is less than stochiometric while the amount of tertiary air will make the total air greater than the stoichiometric requirements of the fuels being burned.

4,347,053

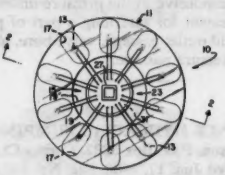
PHOTOGRAPHIC FLASH DEVICE USING LIGHT-EMITTING PYROTECHNIC CHARGES

Timothy Fohl, Carlisle, and Andre C. Bouchard, Peabody, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed May 5, 1980, Ser. No. 146,578

Int. Cl.³ F21K *5/00*

U.S. Cl. 431—359 **19 Claims**



1. A photographic flash device comprising:

a light-transmitting, insulative housing including a plurality of individual chambers and a common expansion cavity therein, each of said chambers having access to said expansion cavity through an opening therebetween, said expansion cavity substantially larger than each of said chambers;

a plurality of pyrotechnic charges, each of said charges located within a respective one of said chambers within said housing for emitting light through said housing upon ignition thereof, each of said charges exhausting into said expansion cavity through said opening; and

a plurality of electrical ignition means each connected to a respective one of said pyrotechnic charges to permit said charges to be individually flashed.

4,347,054

ORTHODONTIC EXPANSION SCREW

Hans-Joachim Kraus, Waldbronn, and Berthold Walter, Remchingen-Wl, both of Fed. Rep. of Germany, assignors to Dentaurum H.P. Winkelstroeter KG, Ispringen, Fed. Rep. of Germany

Filed Mar. 20, 1978, Ser. No. 887,955

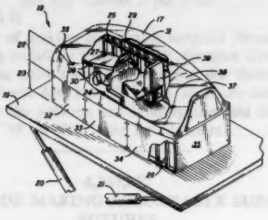
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1977, 2712696

Int. Cl.³ A61C *7/00*

U.S. Cl. 433—7 **8 Claims**

1. An orthodontic expansion screw comprising a first body section having a projecting portion of reduced cross-sectional area extending from a body portion of larger cross-sectional area and having a theaded bore extending through said body portions; said body portions being integrally formed in a single unit; a second body section having a relieved portion for receiving said first section projecting portion in overlapping relation; said second section having a portion defining a threaded bore in axial alignment with said relieved portion; at least one guide pin attached to said first body section, said

second body section having a guide bore for receiving said guide pin and having a projecting guide portion which prolongs its guide bore; said guide portion extending beyond the threaded bore of said second body section in the direction of said first body section; said relieved portion and threaded bore portion of said second section being integrally formed in a single unit; spindle means threadedly engaging said threaded bores of said first and second body sections for effecting relative movement between said screw sections; said threaded bore in said screw first body section projecting portion enabling said first body section to be moved along the length of said spindle means a distance greater than the length of said bore in said first body section portion of larger sectional area in the course of effecting movement of said first body section relative to said second body section; retention means connected to each screw body section for retainin said screw body sections relative to teeth of a user of said screw.



4,347,055

SIMULATOR STRUCTURE

Robert J. Geiger, Kirkwood, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Filed Jul. 2, 1980, Ser. No. 165,178
Int. Cl.³ G09B 9/08
U.S. Cl. 434—30 **2 Claims**

1. A vehicle simulator structure to present a maximum of realism for a trainee in the operator's position within the simulator, said vehicle simulator being of a type in which said trainee in the operator's position can see at least a portion of the external surface of the vehicle being simulated, said simulator structure comprising:

a planar surface to function as the simulator base,

a first pair of spaced-apart sill members extending horizontally and spaced from said planar surface a predetermined distance to define space to enclose simulator-related components,

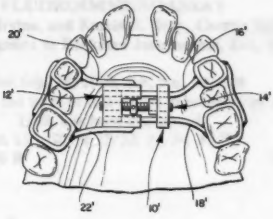
a second pair of spaced-apart sill members extending substantially parallel to said first sill members on the opposite side furthermost from said planar surface and spaced from said first sill members by a distance precalculated to cover only the portion of the vehicle being simulated that is visible from the operator's position,

the length of said simulator structure is co-extensive with the length of said first and second pairs of sill members, which length is limited to only as far forward and at least as far rearward from the operator's position on the vehicle being simulated that is visible from the operator's position,

a first plurality of spaced-apart rib members extending between said planar surface and said first sill members to fixedly support said first sill members at said predetermined distance from said planar surface,

a second plurality of spaced-apart rib members extending between said first and said second sill members, each rib member in said second plurality being removable selectively,

the outer edge of said second plurality of rib members being



formed to substantially the same contours as the corresponding ribs in a vehicle being simulated and the length of these second plurality of rib members being sufficient to space said second sill members from said first sill members by said precalculated distance,

said second plurality of rib members being spaced apart from each other a distance substantially the same as the corresponding ribs in a vehicle being simulated,

the thickness of each one of said second plurality of rib members is sufficient to provide strength to support at least the same component supported by the corresponding rib members in the vehicle being simulated,

a plurality of surface panel members preformed to cover predetermined rib members, a plurality of means to fixedly attach preselected surface panel members in position, and

means to detachably attach the panel members not selected for fixedly attaching in position,

so that the panel members which are detachably attached are removable for access to the space within the simulator.

4,347,056

METHOD OF MAKING ABSORBABLE SURGICAL THREADS

Boris G. Yasnitsky, pereulok Rogatinsky, 56, kv. 1; Galina M. Tsukanova, prospekt Moskovsky, 198/2, kv. 66; Valentin A. Oridoroga, ulitsa Sotsialisticheskaya, 15, all of Kharkov, and Jury A. Furmanov, prospekt Nauki, 142, korpus 12, kv. 4, Kiev, all of U.S.S.R.

Filed Feb. 17, 1981, Ser. No. 235,053
Int. Cl.³ D06M *1/00, 1/22*
U.S. Cl. 8—116 R 4 Claims

1. A method of making absorbable surgical threads consisting in oxidizing cellulose threads with nitrogen oxides, washing said threads with water and treating the threads with a protophilic solvent for 1 to 2 hours at room temperature, removing from the solvent and holding the said threads at a temperature of 70° to 90° C. for 1 to 2 hours.

4,347,057

METHOD OF MAKING ABSORBABLE SURGICAL SUTURES

Boris G. Yasnitsky, pereulok Rogatinsky, 56, kv. 1; Galina M. Tsukanova, prospekt Moskovsky, 198/2, kv. 66; Valentin A. Oridoroga, ulitsa Sotsialisticheskaya, 15, all of Kharkov, and Jury A. Furmanov, prospekt Nauki, 142, korpus 12, kv. 4, Kiev, all of U.S.S.R.

Filed Mar. 5, 1981, Ser. No. 240,680
Int. Cl.³ D06M *1/00, 1/22*
U.S. Cl. 8—116 R 2 Claims

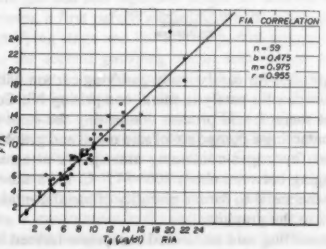
1. A method of making absorbable surgical sutures comprising treating cellulose threads with nitrogen dioxide in a solution of an organic solvent at a temperature of −11° to 21° C. for 10 to 30 minutes, withdrawing the cellulose threads from the organic solvent and holding them in a sealed chamber at a temperature of +30° to 70° C. for 15 minutes to 1.5 hours at a superatmospheric pressure of 506 hPa to 1519 hPa.

4,347,058

THYROID POLARIZATION FLUOROIMMUNOASSAY

Alan J. Polito, Irvine, and Kurtis R. Bray, Garden Grove, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Sep. 15, 1980, Ser. No. 187,238
The portion of the term of this patent subsequent to Aug. 31, 1999, has been disclaimed.
Int. Cl.³ G01N *33/52, 33/54, 33/78*
U.S. Cl. 23—230 B 11 Claims



1. A polarization fluoroimmunoassay for a thyroid hormone selected from a group consisting of $(T_3)_x$ and $(T_4)_{1-x}$, wherein x is 0 or 1 comprising:

(a) contacting a serum sample to be assayed with an amount of a suitable base sufficient to denature thyroxine binding globulins present in said serum sample to thereby form a solution;

(b) incubating said solution;

(c) contacting an aliquot of said solution with a separating agent;

(d) separating thyroid hormone bound to separating agent from serum and thereby simultaneously removing nonspecific serum effects as well as background fluorescence;

(e) contacting said thyroid hormone bound to separating agent with an antibody against said thyroid hormone, said antibody having a higher affinity for said thyroid hormone than the affinity of said separating agent for said thyroid hormone;

(f) incubating said separating agent-antibody combination;

(g) separating free antibody and thyroid hormone bound antibody from said separating agent;

(h) contacting said free antibody with fluorescent labeled thyroid hormone; and

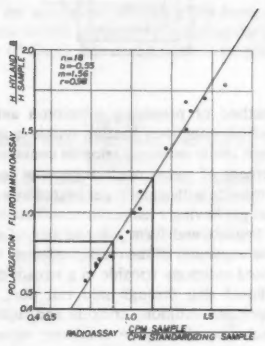
(i) fluorometrically measuring the fluorescence polarization in said mixture of step (h); wherein said measurement is directly proportional to the level of said thyroid hormone in the serum sample being assayed.

4,347,059

T_3 UPTAKE POLARIZATION FLUOROIMMUNOASSAY

Alan J. Polito, Irvine, and Kurtis R. Bray, Garden Grove, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Sep. 15, 1980, Ser. No. 187,239
The portion of the term of this patent subsequent to Aug. 31, 1999, has been disclaimed.
Int. Cl.³ G01N *33/52, 33/54, 33/78*
U.S. Cl. 23—230 B 11 Claims



1. A T_3 uptake polarization fluoroimmunoassay procedure comprising:

(a) contacting a serum sample to be assayed with T_3 to thereby form a solution, the amount of said T_3 being sufficient to assess the unsaturated binding capacity of serum proteins;

(b) contacting an aliquot of said solution with a separating agent;

(c) incubating said aliquot-separating agent combination;

(d) separating T_3 bound to separating agent from said serum and thereby simultaneously removing nonspecific serum effects as well as background fluorescence;

(e) contacting said T_3 bound separating agent with an antibody against T_3, said antibody having a higher affinity for T_3 than the affinity of said separating agent for T_3 and the amount of said antibody being sufficient to remove at least substantially all of said T_3 from said separating agent;

(f) incubating said separating agent-antibody combination;

(g) separating free antibody and T_3 bound antibody from said separating agent;

(h) contacting said free antibody with fluorescent labeled T_3; and

(i) fluorometrically measuring the fluorescence polarization in said mixture of step (h);

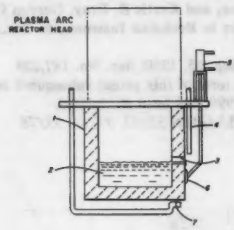
wherein said measurement is inversely proportional to the T_3 uptake of the sample being assayed.

4,347,060

METHOD FOR MAKING ANTIMONY TRIOXIDE POWDER

Roy L. Blizzard, Mission Viego, Calif., and Thomas O. Martin, Pasadena, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 86,379, Oct. 19, 1979, abandoned. This application Apr. 22, 1981, Ser. No. 256,436
Int. Cl.³ B01D 7/00
U.S. Cl. 23—294 R 10 Claims



1. A method of preparing submicron antimony trioxide powder, which comprises heating within a reactor having a side exit port crude antimony trioxide containing from 1 to 10 weight percent of metal oxide impurities less volatile than antimony trioxide with an inert gas heated by a plasma arc, said heated inert gas having a temperature sufficient to vaporize the antimony trioxide and form a liquid slag of the less volatile metal oxide impurities of the crude antimony trioxide, removing vaporized antimony trioxide in a stream of exhausted hot gas, and liquid slag through said exit port, contacting the exiting vaporized antimony trioxide and liquid slag with an inert quench gas, thereby to condense vaporized antimony trioxide, separating condensed antimony trioxide powder having a weight mean particle size of between about 0.1 and about 0.5 micron from the exhausted gas, and mechanically removing solidified slag periodically from the exit port.

4,347,061

LIQUID FUEL COMPOSITION, METHOD OF PREPARING SAID COMPOSITION AND EMULSIFIER

Rud F. Madsen; W. Kofod Nielsen, and Ole Hansen, all of Nakskov, Denmark, assignors to Aktieselskabet de Danske Sukkerfabrikker, Copenhagen, Denmark

Filed May 23, 1980, Ser. No. 152,745
Claims priority, application Denmark, May 28, 1979, 2198/79
Int. Cl.³ C10L 1/32
U.S. Cl. 44—51 12 Claims

1. A liquid fuel composition comprising a stable emulsion of a liquid mineral oil fuel, an aqueous solution of a product selected from the group consisting of saccharose, starch decomposition products and mixtures thereof, and at least one non-ionic polymeric emulsifier.

4,347,062

COMPLEXES OF HIGH IRON CONTENT SOLUBLE IN ORGANIC MEDIA AND USABLE AS COMBUSTION ADDITIVES IN LIQUID FUELS

Maurice Born, Nanterre; Lucienne Briquet, and Gabriel de Gaudemaris, both of Rueil-Malmaison, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Mar. 14, 1980, Ser. No. 130,307
Claims priority, application France, Mar. 16, 1979, 79 06783
Int. Cl.³ C10L 1/30
U.S. Cl. 44—68 42 Claims

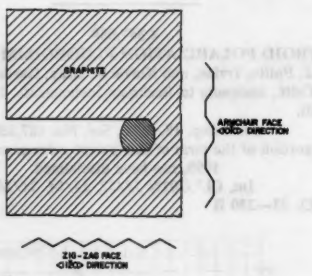
1. An iron complex soluble in hydrocarbon fuels, said complex being formed from at least one sulfonic acid and ferric iron; wherein the ratio R of the number of acid gram-equivalents of said sulfonic acid to the number of gram-atoms of iron in said complex is from about 1/6 to 1/12.

4,347,063

PROCESS FOR CATALYTICALLY GASIFYING CARBON

Rexford D. Sherwood, Suffern, N.Y.; Rees T. K. Baker, Murray Hill, N.J.; Eric G. Derouane, Champion, Belgium, and Wim J. Pieters, Morristown, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 27, 1981, Ser. No. 248,266
Int. Cl.³ C10J 3/00
U.S. Cl. 48—197 R 9 Claims



1. A process for catalytically gasifying carbon with steam in the presence of a catalytic metal comprising Ni, Co, Mo and mixtures thereof, said process comprising the steps of:

(a) contacting a composite of said metal and graphite with an inert, hydrogen-containing atmosphere at a temperature ranging between about 800°–975° C. for a time sufficient for the metal to form a plurality of metal-containing channels in the graphite;

(b) contacting said channeled composite formed in (a) with an inert hydrogen-containing atmosphere at a temperature of at least about 975° C. for a time sufficient for said metal in said channels to spread out and chemically wet at least a portion of the surface of said channels;

(c) contacting said metal-wetted, channeled composite formed in (b) with an oxidizing atmosphere at a temperature of at least about 800° C. to form a dispersion of discrete particles of said metal on said graphite; and

(d) contacting the dispersed metal/graphite composite formed in (c) with steam at a temperature of at least about 800° C. for a time sufficient for the metal to achieve the desired amount of gasification of the carbon.

4,347,064

PROCESS OF GASIFYING FINE-GRAINED SOLID FUELS

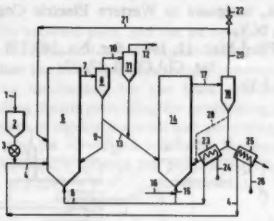
Lothar Reh; Martin Hirsch, both of Frankfurt am Main; Gerhard Baron, Hofheim; Eberhard Blaum, and Carl Hafke, both of Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 64,977, Aug. 8, 1979, abandoned. This application Jan. 19, 1981, Ser. No. 225,952

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1978, 2836175

Int. Cl.³ C10J *3/54*

U.S. Cl. 48—197 R 9 Claims



1. In a process of gasifying fine-grained solid fuels to produce a product gas which contains hydrogen, carbon oxides and methane in two interconnected gasifying stages by treatment with at least one of the gasifying agents of the group consisting of steam, oxygen and carbon dioxide, the gasifying stage containing a first reactor and a first separation zone, said first reactor containing a circulating fluidized bed zone, fresh fine-grained solid fuel is introduced into said first reactor of the first gasifying stage and partially gasified therein and product gas is withdrawn from said first separation zone, maintaining a temperature in the first gasifying stage in the range of 800° to 1100° C., in said first separation zone, solids are separated from said product gas and said separated solids are divided into two partial streams, a first partial stream of which is recycled into the first gasifying stage and the second partial stream of solids is fed into the second gasifying stage, said second gasifying stage containing a second reactor and a second separation zone, said second reactor containing a circulating fluidized bed zone, in said second separation zone solids are separated from the hot gas produced in said second gasifying stage, feeding gasifying agent into the reactor of the first gasifying stage which consists mainly of steam and contains less oxygen than the gasifying agent fed into the second gasifying stage; and maintaining a temperature in the second gasifying stage which is higher than the temperature maintained in the first gasifying stage and is below the melting point of ash formed from the solid fuel; the improvement which comprises

A. maintaining a pressure in the first and second gasifying stage in the range of 10 to 60 bars;

B. feeding at least one-half of the hot gas from the second separation zone into the reactor of the first gasifying stage;

C. a first part of the separated solids from the second separation zone is recycled to the second gasifying stage and the balance of said separated solids is withdrawn, and

D. cooling that portion of solids withdrawn in step C and neither feeding the cooled withdrawn solids into said first nor said second gasifying stage.

4,347,065

PROCESS FOR THE SEPARATION OF PAINT MISTS FROM THE EXHAUST AIR OF LACQUER PAINTING PLANTS

Wolfgang Gans, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jul. 10, 1981, Ser. No. 282,166

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1980, 3028706

Int. Cl.³ B01D *51/00*

U.S. Cl. 55—6 3 Claims

1. A process for the separation of paint mists from the exhaust gases of lacquer painting plants, characterized in that the exhaust gases containing paint particles comprising the mists are conducted through a microwave field to convert the paint particles to paint dust and the thus-produced paint dust is separated from the exhaust gases by means for removing dust and like solid particles from gases.

4,347,066

REMOVAL OF CO AND UNSATURATED HYDROCARBONS FROM GAS STREAMS USING COPPER OXALATE COMPLEXES

Gerald Doyle, Whitehouse Station, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 13, 1981, Ser. No. 282,654

Int. Cl.³ B01D *53/14*

U.S. Cl. 55—56 15 Claims

1. A process for selectively removing CO from a CO containing gas stream which comprises contacting the gas stream with a mixture of Cu_2O and oxalic acid in an inert organic solvent.

4,347,067

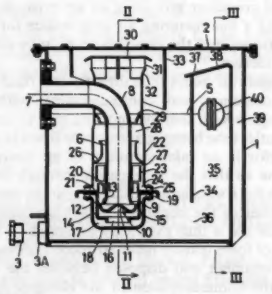
GAS SCRUBBER WITH PLURAL VERTICAL LIQUID INLETS

Arthur J. Homer, Selcourt, South Africa, assignor to Marrett Manufacturing (Proprietary) Limited, Boksburg, South Africa

Filed May 14, 1981, Ser. No. 263,538

Int. Cl.³ B01D *47/02, 47/10*

U.S. Cl. 55—227 10 Claims



1. A gas-scrubber, comprising: a scrubbing mechanism located within a container shaped housing (1) containing a scrubbing liquid to a predetermined level (5), gas inlet conduit (6) having a portion thereof extending downwardly within said housing and wherein the scrubbing mechanism is arranged concentrically with said downwardly extending portion of said gas inlet conduit (6), said mechanism comprising means (10) for distributing gas emanating from a lower end of the inlet conduit portion around the circumference thereof such that the path of the gas is upwardly directed around the outside of the inlet conduit portion, means (14) surrounding the distributing

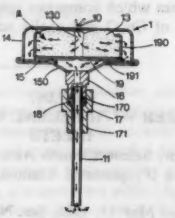
means for defining therewith a first scrubbing liquid inlet (15) located adjacent the path for upwardly moving gas emanating from the lower end of the inlet conduit portion and having an opening (16) communicating with the liquid contained in the housing, a plurality of angularly spaced upwardly directed transfer conduits (20) disposed around the inlet conduit portion in said path above the first scrubbing liquid inlet and constructed and arranged with respect to larger diameter co-axial tubular passage members (23) located directly above the transfer conduits so as to define therewith both a second scrubbing liquid inlet and venturi means for drawing further quantities of scrubbing liquid into admixture with the initial gas-liquid mixture, a cowling (22) enclosing the gas inlet conduit portion, transfer conduits and tubular members and defining a mixing chamber (28) above the tubular members for promoting adequate mixing of the gas and scrubbing liquid, and means defining an outlet (31) at the upper end of the cowling co-axial with the inlet conduit portion for directing a gas liquid mixture outwardly above the level of liquid in the scrubber housing and said housing having a gas outlet.

4,347,068

ADMISSION DEVICE FOR AN INLET MANIFOLD OF AN INTERNAL COMBUSTION ENGINE

Walter R. Cooper, 18 St. Helen's Way, Allesley, Conventry, West Midlands, England

Filed Jan. 30, 1980, Ser. No. 117,000
Int. Cl.³ B01D *50/00*; F02M *23/04*
U.S. Cl. 55—319 **2 Claims**



1. An air admission device for an inlet manifold of an internal combustion engine comprises:

a closed container providing an air expansion chamber and having a fine metering air inlet orifice for entry of atmospheric air into the chamber so as to be cooled by expansion therein;

an elongate air outlet tube directly and rigidly connected to the container and communicating with the chamber through a wall thereof opposite said air inlet orifice, said air outlet tube being adapted to be fitted in a hole provided therefor in an inlet manifold of an internal combustion engine so that the tube passes through the hole and extends for a substantial distance into the manifold from the chamber of the container, which container in such position of use is thus exteriorly mounted on the manifold;

a body of foam texture material accommodated in the expansion chamber and disposed between the air inlet orifice and the communication of the elongate outlet tube with said chamber, said body of foam material having a central opening therein for receiving air flow from the air inlet orifice; and

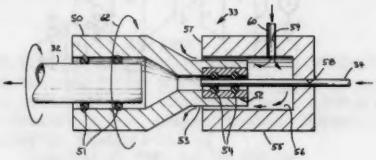
a deflector plate in the chamber carrying the body of foam texture material and interposed between the latter and the communication of the elongate outlet tube with the chamber, said deflector plate being radially channelled at that side thereof opposite to the body of foam texture material for the passage of air between the deflector plate and the wall of the container adjacent thereto and through which the elongate outlet tube communicates with the chamber, the deflector plate further having side lugs engaging the body of foam texture material for location of said body on the deflector plate and in the chamber with annular clearance therein whereby air entering the chamber through the fine metering air inlet orifice enters the central opening in the body of foam texture material and is deflected radially outwardly therethrough by the deflector plate to the annular clearance for subsequent inward radial flow between the radially channelled side of the deflector plate and the adjacent wall of the container to the communication of the elongate outlet tube and via the latter into the inlet manifold for creating turbulence in the flow of a fuel/air mixture through the manifold into the engine.

4,347,069

METHOD OF SUPPLYING FLUID TO A ROTATING TUBE

Eugene A. Haney, Lawrenceville, and Fred P. Partus, Marietta, both of Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 11, 1981, Ser. No. 242,775
Int. Cl.³ C03B *37/07*
U.S. Cl. 65—3.12 **6 Claims**



1. A method of introducing a vapor stream into a rotating optical fiber preform tube comprising the steps of:

a. generating a vapor stream comprised of a vaporized glass forming precursor entrained in an oxidizing carrier gas;

b. flowing the vapor stream into the rotating optical fiber preform tube through an at least partially sealed rotary joint; and

c. preventing any material alteration in the composition of the vapor stream from occurring should the rotary joint seal become leaky by flowing a stream of fluid consisting essentially of said oxidizing carrier gas over the rotary joint at a pressure greater than the pressure of the vapor stream as it flows through the rotary joint.

6. A method of delivering a fluid stream through a stationary conduit and into a rotating tube through a junction of the stationary conduit and the rotating tube without altering the qualitative composition of the fluid stream by ingress of ambient air at the junction, characterized by flowing a fluid constituent of the fluid stream over the junction at a pressure in excess of the pressure of the fluid stream within the junction.

4,347,070

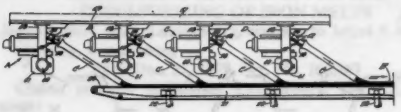
CONTROLS FOR TORATION FIBERIZATION

Marcel Levecque, Birchrunville, Pa.; Jean A. Battigelli, and Dominique Plantard, both of Rantigny, France, assignors to Saint-Gobain Industries, Paris, France

Continuation of Ser. No. 926,954, Jul. 20, 1978, Pat. No. 4,199,338, which is a continuation-in-part of Ser. No. 834,540, Sep. 19, 1977, Pat. No. 4,145,203, Ser. No. 762,789, Jan. 25, 1977, Pat. No. 4,102,662, and Ser. No. 676,755, Apr. 14, 1976, Pat. No. 4,118,213, said Ser. No. 762,789, and Ser. No. 676,755, each is a continuation-in-part of Ser. No. 557,282, Mar. 11, 1975, Pat. No. 4,015,964, which is a continuation-in-part of Ser. No. 353,984, Apr. 24, 1973, Pat. No. 3,885,940. This application Dec. 10, 1979, Ser. No. 102,256
Claims priority, application France, Apr. 19, 1978, 78 11488
Int. Cl.³ C03B *37/04*
U.S. Cl. 65—9 **7 Claims**

1. Apparatus for forming fibrous blanket comprising a perforated fiber collecting conveyor moving in a generally horizon-

tal path, fiber forming mechanism located above the path of the collecting conveyor and comprising a series of fiberizing centers in a plurality of spaced positions along the path of the conveyor, each center including a supply means for delivering a downwardly directed stream of molten thermoplastic attenuable material, and each center including means for effecting gaseous attenuation of the streams of molten material comprising means for generating a gaseous blast and means for generating a gaseous jet, the blast generating means being directed in



a downwardly inclined path, and the jet being of smaller cross section than the blast and having higher kinetic energy per unit of volume than the blast and penetrating transversely thereof, and mounting mechanism for the blast and jet generating means including means providing for positioning the jet in the path of a stream of molten material and providing for delivery of the blast and jet in various relatively inclined paths both directed downwardly toward the path of the fiber collecting conveyor.

4,347,071

APPARATUS FOR PRODUCTION AND CUTTING OF GLASS FIBRES

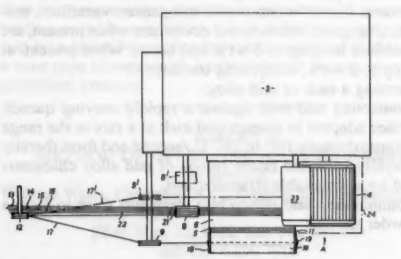
John H. Willis, Anderson, S.C., and Trevor C. Heath, Yateley, England, assignors to TBA Industrial Products, Limited, Manchester, United Kingdom and Bishop & Associates, Incorporated, Greenville, S.C.

Continuation of Ser. No. 97,249, Nov. 26, 1979, abandoned. This application Feb. 20, 1981, Ser. No. 236,362

Claims priority, application United Kingdom, Nov. 24, 1978, 45911/78

Int. Cl.³ C03B *37/025*

U.S. Cl. 65—10.2 **8 Claims**



1. In an apparatus for drawing newly-spun and dressed glass filaments from a bushing, of the kind having:

(a) a rotary cutter constituted by a blade roll with radially directed blades projecting from its surface,

(b) a back-up roll having a resilient surface,

(c) means mounting said blade roll and said back-up roll with their respective axes of rotation parallel and with at least the tips of the blades of the blade roll in contact with said resilient surface of the back-up roll to define a cutting zone for the cutter,

(d) an auxiliary start-up roll,

(e) variable speed drive means for accelerating said auxiliary start-up roll to a surface speed at least equal to the surface speed of the cutter roll under production conditions,

(f) guide means operable to divert a bundle of filaments being wound on said auxiliary start-up roll to the surface of the back-up roll and thereafter into the cutting zone of the cutter, whereby the filaments are cut into staple fibers,

the improvement that said auxiliary start-up roll is adapted to receive plural turns of a bundle of filaments wound thereon to form a cake such that said bundle may be subjected to drawing as said start-up roll rotates.

4,347,072

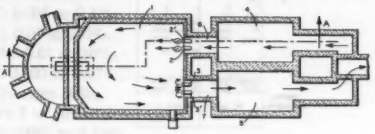
METHOD AND DEVICE FOR REDUCING NO_x GENERATED IN GLASS-MELTING FURNACE

Kinnosuke Nagaoka, Amagasaki; Tsumugu Kato, and Mitsuru Nozawa, both of Nagoya, all of Japan, assignors to Ishizuka Glass Co., Ltd., Aichi and Agency of Industrial Science and Technology, Tokyo, both of, Japan

Filed Nov. 21, 1980, Ser. No. 209,043

Int. Cl.³ C03B *5/16*

U.S. Cl. 65—27 **12 Claims**



1. A method for reducing NO_x content in a waste gas generated in a glass melting furnace of side firing or end firing type which is equipped with a regenerator, comprising supplying hydrocarbons into the waste gas from fuel combustion produced over a melting tank within a combustion chamber, without supplying sufficient additional oxygen for burning said hydrocarbons, so as to effect the reducing reaction of the NO_x in the combustion waste gas.

9. A glass-melting furnace of side firing or end firing type equipped with a regenerator, comprising a combustion chamber provided above a glass-melting tank in which an unmelted batch material is fed and melted material is stored, at least two sets of burners for alternatively feeding a fuel and oxygen supply which is to be burned into the combustion chamber, means for feeding hydrocarbons into the waste gas produced by combustion of the fuel simultaneously with the feeding of fuel and oxygen supply by a first set of burners, and control means for restricting the oxygen supply to the hydrocarbon feeding means while combustion is occurring at said first set of burners, whereby the NO_x in the waste gas from the glass-melting furnace can be reduced.

4,347,073

METHOD OF PRODUCING GLASS FROM AGGLOMERATES WHICH INCLUDE ORGANIC COATED SCRAP GLASS

Patrick F. Aubourg, Granville, and Mark A. Propster, Gahanna, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 12, 1981, Ser. No. 242,879

Int. Cl.³ C03B *1/00*

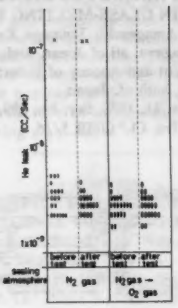
U.S. Cl. 65—28 **9 Claims**

1. In a process comprising converting molten-glass forming ingredients and water into agglomerates, heating a vertical bed of gravitationally downwardly moving agglomerates in a chamber by direct contact with a gaseous heating medium so as to produce dry, heated non-aggregated agglomerates, melting said agglomerates in a glass melting furnace, the improvement wherein a portion of said molten-glass forming ingredients includes glass cullet having an organic coating thereon and pyrolizing said coating during said heating step.

4,347,074
SEALING TECHNIQUE FOR SEMICONDUCTOR DEVICES

Akio Inohara, Osaka; Kiyoshi Sawae, Nara; Hisao Kawaguchi, Sakai, and Takeo Fujimoto, Osaka, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 17, 1980, Ser. No. 207,470
Claims priority, application Japan, Nov. 16, 1979, 54-149294; Feb. 14, 1980, 55-17446; Feb. 14, 1980, 55-17447
Int. Cl.³ C03C 27/04
U.S. Cl. 65—32 4 Claims



1. A method for sealing a semiconductor device, comprising the steps of:

introducing a semiconductor device into a sealing chamber;

applying a glass frit to said semiconductor device; p1 pressurizing the atmosphere in said sealing chamber such that the internal pressure of said chamber is greater than one-half the atmospheric pressure at room temperature after sealing;

introducing an inert gas into the atmosphere of said sealing chamber, thereby pre-sealing said semiconductor device with said glass frit under the inert gas atmosphere; and

introducing oxygen gas into the atmosphere of said sealing chamber, thereby completing the sealing of said semiconductor device with said glass frit.

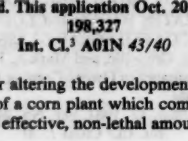
3. The method of claim 1, wherein said inert gas comprises nitrogen gas.

4,347,075
METHOD FOR USING NICOTINIC ACID DERIVATIVES AS PLANT GROWTH REGULANTS

Frederic G. Bollinger; John J. D'Amico, both of St. Louis, and Dale J. Hansen, St. Charles, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

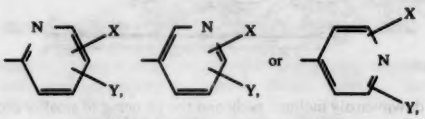
Division of Ser. No. 932,736, Aug. 9, 1978, Pat. No. 4,261,730, which is a continuation-in-part of Ser. No. 753,260, Dec. 22, 1976, abandoned. This application Oct. 20, 1980, Ser. No. 198,327
Int. Cl.³ A01N 43/40
U.S. Cl. 71—94 2 Claims

1. A method for altering the development of the reproductive components of a corn plant which comprises applying to said corn plant an effective, non-lethal amount of a compound of the formula



wherein R is hydrogen or lower alkyl; R_1 is nitrogen; R_2 is

pyridyl,



wherein X is hydrogen, halogen, CF_3, lower alkyl or lower alkoxy; Y is halogen, CF_3, lower alkyl or lower alkoxy; provided that neither X nor Y may be chlorine in the 4 position when the nitrogen atom is in the 3 position; and agriculturally acceptable salts thereof.

4,347,076
ALUMINUM-TRANSITION METAL ALLOYS MADE USING RAPIDLY SOLIDIFIED POWERS AND METHOD

Ranjan Ray, Waltham, Mass.; Donald E. Polk, Washington, D.C., and Bill C. Giessen, Cambridge, Mass., assignors to Marko Materials, Inc., North Billerica, Mass.

Filed Oct. 3, 1980, Ser. No. 193,417
Int. Cl.³ C22C 1/04
U.S. Cl. 75—0.5 R 19 Claims

1. The method of making an alloy comprised of at least one of the group consisting of nominally pure aluminum and conventional aluminum alloys containing at least 80 wt% aluminum wherein said one of the group is further alloyed with between 5 to 16 wt% of a transition metal selected from the group consisting of iron, nickel, cobalt, manganese, vanadium, chromium, molybdenum, tungsten, titanium, zirconium, boron, and mixtures thereof wherein said manganese, vanadium, molybdenum, tungsten, titanium and zirconium, when present, are at a combined level up to 5 wt% and boron, when present, at a level up to 1 wt%, comprising the steps of

(a) forming a melt of said alloy,

(b) contacting said melt against a rapidly moving quench surface adapted to quench said melt at a rate in the range of approximately $10^{5°}$ to $10^{7°}$ C./second and form thereby a rapidly solidified brittle ribbon of said alloy characterized by a metastable structure, and,

(c) comminuting said ribbon into fragments so as to form a powder thereof.

4,347,077
PROCESS FOR PRODUCING MAGNESIUM ALLOYS

Takeshi Goto, Atsugi; Noboru Kawakami, Tokyo; Itsuo Hirano, Sagamihara; Yoichi Itakura, Musashino, and Yuji Kawahara, Chigasaki, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Nov. 12, 1980, Ser. No. 206,298
Claims priority, application Japan, Nov. 19, 1979, 54-148993
Int. Cl.³ C22C 23/00, 1/00
U.S. Cl. 75—0.5 B 7 Claims

1. Process for producing a magnesium alloy which comprises the steps of:

(a) reducing magnesium oxide with a carbonaceous substance at high temperature to form a gaseous reaction product comprising gaseous magnesium,

(b) rapidly gas cooling said gaseous reaction product with a cooling gas in an amount of at least 10 times the amount of

said gaseous reaction product in an inert atmosphere containing metal powder of at least one of aluminum, copper, nickel, iron, silicon, or alloys thereof,

(c) condensing the gaseous magnesium on the surface of said metal powder, and

(d) subjecting the condensed product of step (c) to heat treatment.

4,347,078

PROCESS AND APPARATUS FOR THE DESULFURIZING OF IRON MELTS

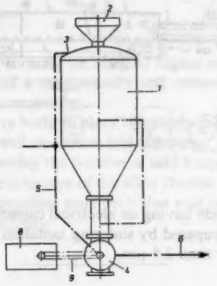
Jean Goedert, Esch, Luxembourg, assignor to Arbed S.A., Luxembourg, Luxembourg

Filed Dec. 21, 1979, Ser. No. 106,367

Claims priority, application Luxembourg, Dec. 21, 1978, 80692

Int. Cl.³ C21C 7/00

U.S. Cl. 75—51 5 Claims



1. In a method for the desulfurizing of iron melts of the type in which an iron melt in a metallurgical vessel is treated with a desulfurizing agent blown in by means of a propellant through inlet means, the improvement comprising providing a storage bin that is connected over a vane type blowthrough feeder and gas propellant means with said inlet means; maintaining within said inlet means a gas propellant pressure higher than the counteracting ferrostatic pressure; and continuously feeding variable quantities of a desulfurizing agent through said inlet means by varying the rotational speed of the vanes in a vane type blowthrough feeder, without having to vary said propellant pressure.

4,347,079

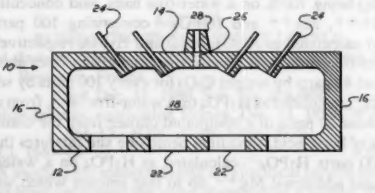
METHOD OF OPERATING AN OPEN-HEARTH FURNACE

William Wells, Charlotte, N.C., assignor to Korf Technologies, Inc., Charlotte, N.C.

Filed Mar. 12, 1981, Ser. No. 243,019

Int. Cl.³ C21C 7/00

U.S. Cl. 75—52 7 Claims



1. In a method of operating an open-hearth furnace to produce steel in a molten metal bath therein, said furnace having a front wall with charging openings therein and a back wall with a taphole therein, the improvement comprising introducing at least one stream of oxygen through the furnace back wall lining on each side of the furnace taphole, each oxygen stream being injected horizontally through a tuyere beneath the surface of the molten metal bath and said stream being inclined toward the center of the molten metal bath at an angle between the tuyere and the furnace back wall lining of from about 45° to about 60° to form an active bath area in said furnace in front of said taphole.

4,347,080

AUSTENITIC FREE-CUTTING STAINLESS STEEL

Minoru Yanagida, Ohbu, and Tomio Kono, Nagoya, both of Japan, assignors to Daido Tokushuko K.K., Nagoya, Japan

Filed Jan. 7, 1981, Ser. No. 223,034

Claims priority, application Japan, Jan. 12, 1980, 55/1749; Sep. 18, 1980, 55/128635; Oct. 17, 1980, 55/144409

Int. Cl.³ C22C 38/06

U.S. Cl. 75—124 7 Claims

1. An austenitic free-cutting stainless steel which essentially consists of:

C: 0.005 to 0.2%,
Si: 0.01 to 2.0%,
Mn: 0.01 to 20%,
S: 0.005 to 0.07%,
Cr: 12 to 30%,
Ni: 2 to 20%,
N: 0.003 to 0.10%,
Pb: 0.03 to 0.40%,
B: 0.0005 to 0.030%, and the balance being substantially Fe.

4,347,081

DENTAL ALLOY

Arthur Minkowitz, Albertson, N.Y., assignor to Futura Dental Products, Inc., Long Island City, N.Y.

Filed Aug. 27, 1981, Ser. No. 296,872

Int. Cl.³ C22C 9/04

U.S. Cl. 75—157.5 5 Claims

1. An alloy consisting essentially of in percent weight:

copper	60–66
silicon	0.60–1.65
aluminum	0.25–0.75
titanium	0.20–0.80
chromium	0.10–0.80, and
zinc	33–36.

4,347,082

MISCHMETAL ALLOY FOR STORAGE OF HYDROGEN

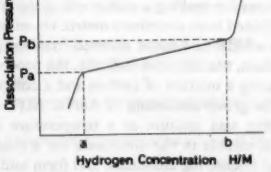
Yasuaki Osumi, Minoo; Hiroshi Suzuki, Ikeda; Akihiko Kato, Matsubara, and Masanori Nakane, Ibaragi, all of Japan, assignors to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Oct. 1, 1980, Ser. No. 192,809

Claims priority, application Japan, Oct. 23, 1979, 54-137489

Int. Cl.³ C22C 19/05

U.S. Cl. 75—171 2 Claims



1. A quaternary mischmetal alloy for storage of hydrogen,

having a low flatness factor and represented by the general formula:

$$MmNi_{5-x}Cr_{x-y}A_y$$

wherein, Mm denotes Mischmetal, A is one member selected from the group consisting of Al, Co, Cu, Fe, Mn and Si, x denotes a number of a value within the range of from 0.1 to 1, y is a number of a value within the range of from 0.01 to 0.99, provided that the value of x is greater than that of y.

4,347,083

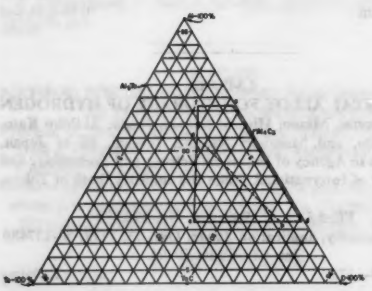
CHEMICALLY BONDED ALUMINUM COATING FOR CARBON VIA MONOCARBIDES

Raymond V. Sara, North Olmsted, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 874,366, Jan. 1, 1978, Pat. No. 4,252,856, which is a division of Ser. No. 697,611, Jun. 18, 1976, Pat. No. 4,104,417, which is a continuation-in-part of Ser. No. 444,556, Feb. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 340,287, Mar. 12, 1973, abandoned. This application Aug. 29, 1980, Ser. No. 182,494

Int. Cl.³ B22F *9/00*; B32B *15/14*; C22C *1/04, 29/00*

U.S. Cl. 75—204 **7 Claims**



4. A process for making a composite material wherein carbon is distributed in an aluminum matrix via an interfacial bond of a metal carbide, said metal selected from the group consisting of tantalum, titanium and hafnium, the process comprising:

(a) preparing a mixture of carbon and a compound selected from the group consisting of Al_3Ta, Al_3Ti and Al_3Hf;

(b) reacting said mixture at a temperature at which said metal is soluble in the aluminum for a time period sufficient to release the aluminum and form said metal carbide interface between the carbon and the aluminum; and

(c) densifying said mixture at a temperature of about the melting temperature of aluminum.

4,347,084

ELECTRODES OF SINTERED TANTALUM POWDER OF FINE GRAIN SIZE AND PROCESS OF PRODUCTION

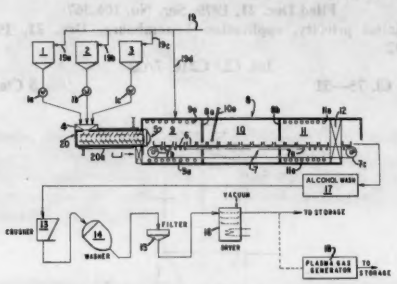
Reinhard Hähn, Langelsheim, and Dieter Behrens, Goslar, both of Fed. Rep. of Germany, assignors to Hermann C. Starck Berlin, Berlin, Fed. Rep. of Germany

Division of Ser. No. 956,898, Nov. 2, 1978, Pat. No. 4,231,790, which is a continuation of Ser. No. 677,038, Apr. 14, 1976, abandoned. This application May 2, 1980, Ser. No. 146,093

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1975, 2517180

Int. Cl.³ B22F *5/00*

U.S. Cl. 75—245 **4 Claims**



1. An electrode having an electrical capacitance in excess of 10,000 $\mu C/g$ prepared by sintering tantalum powder having a grain size finer than 2.5 μm.

4,347,085

INSULATIVE COATINGS FOR ELECTRICAL STEELS

Michael H. Haselkorn, Franklin, and Dannie S. Loudermilk, Middletown, both of Ohio, assignors to Armco Inc., Middletown, Ohio

Filed Apr. 23, 1981, Ser. No. 256,856

Int. Cl.³ C23F *7/10*

U.S. Cl. 148—6.16 **17 Claims**

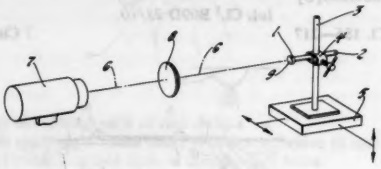
1. An aqueous coating solution for forming an insulative coating directly on electrical steels and on steels having a mill glass thereon, said coating solution comprising a premix solution and a colloidal silica solution, said premix solution containing an Al^{+++}, Mg^{++} and $H_2PO_4^-$ concentration in the following relative relationship on a water-free basis: from 3 to 11% by weight Al^{+++} calculated as Al_2O_3, from 3 to 15% by weight Mg^{++} calculated as MgO, and 78 to 87% by weight $H_2PO_4^-$ calculated as H_3PO_4, the total weight percentage of Al^{+++} (as Al_2O_3), Mg^{++} (as MgO) and $H_2PO_4^-$ (as H_3PO_4) being 100% on a water-free basis, said concentration of Al^{+++}, Mg^{++} and $H_2PO_4^-$ comprising 100 parts by weight calculated as Al_2O_3, MgO and H_3PO_4 respectively on a water-free basis, said premix also comprising from about 10 to about 45 parts by weight C_rO_3 for every 100 parts by weight $H_2PO_4^-$ calculated as H_3PO_4 on a water-free basis, from about 5 to about 20 parts of a compound chosen from the class consisting of boric acid, vanadium pentoxide and mixtures thereof per 100 parts $H_2PO_4^-$ calculated as H_3PO_4 on a water-free basis and additional Mg^{++} up to that amount which will go into solution, said colloidal silica solution being present in an amount of from that amount which will form a good glass up to 40 volume percent to provide a coating solution having a premix solution to colloidal silica solution volume ratio up to 1.5:1.

4,347,086

SELECTIVE MAGNETIZATION OF RARE-EARTH TRANSITION METAL ALLOYS

Andrew R. Chraplyvy, Troy; Jan F. Herbst, Warren, and John J. Croat, Sterling Heights, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 7, 1980, Ser. No. 138,240
Int. Cl.³ H01F 1/00
U.S. Cl. 148—101 3 Claims



1. A method of forming an integral region of hard magnetism in a portion of a magnetically soft rare-earth transition metal alloy body comprising

forming said alloy body to place it entirely in an amorphous, magnetically soft condition and thereafter

selectively tempering the portion of said body in said region to convert the structure of the alloy thereat from an amorphous to a crystalline state such that said region has high magnetic coercivity.

4,347,087

GRANULAR PROPELLANT POWDER BASED ON NITROCELLULOSE, OILY NITRATE ESTER AND POLYVINYL NITRATE, AND PROCESS

Bernard M. Zeller, Brunoy; Rene J. Couturier, Mennecy, and Robert A. Tribot, Hiersac, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Dec. 5, 1979, Ser. No. 100,646
Claims priority, application France, Dec. 22, 1978, 78 36103
Int. Cl.³ C06B 25/26
U.S. Cl. 149—98 7 Claims

1. A granular homogeneous propellant powder having suitable power for use in tank guns, which consists essentially of 50–75 parts by weight of nitrocellulose, 5–25 parts by weight of polyvinyl nitrate and 5–25 parts by weight of an oily nitrate ester which is a member selected from the group consisting of nitroglycerine, trimethylolmethane trinitrate and trimethylolethane trinitrate, said nitrocellulose, said polyvinyl nitrate and said oily nitrate ester being the energy-producing bases in the total amount of 100 parts.

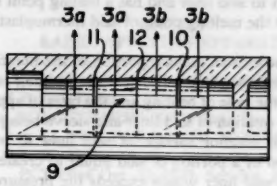
4,347,088

BUBBLE TUBES FOR SPIRIT LEVELS

Daniel Jacquet, Mulhouse, France, assignor to Stanley Mabo S.A., Besancon, France

Filed Dec. 15, 1980, Ser. No. 216,089
Claims priority, application France, Dec. 13, 1979, 79 31027
Int. Cl.³ B29C 27/08; G01C 9/26
U.S. Cl. 156—69 3 Claims

1. A method for manufacturing a cylindrical bubble tube for a spirit level, including the steps of providing a tubular hollow body with a closed end and an open end and an inner barrel-shaped cavity having the same axis as the bubble tube, substantially filling said hollow body with a suitable liquid, inserting a hollow plug having an inner cavity of a precisely determined volume to close the open end of the tubular body and spill some of the liquid therefrom, the volume of the cavity of said plug being equal to the desired volume of the air bubble in said



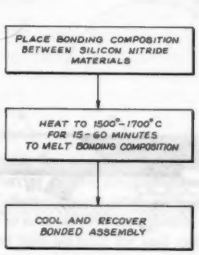
bubble tube, and sealing the plug in the open end of the hollow body.

4,347,089

METHOD FOR BONDING SILICON NITRIDE

Ronald E. Loehman, Palo Alto, Calif., assignor to SRI International, Menlo Park, Calif.

Filed Jul. 29, 1981, Ser. No. 288,125
Int. Cl.³ C03C 29/00; C04B 33/34, 37/00
U.S. Cl. 156—89 10 Claims


PLACE BONDING COMPOSITION BETWEEN SILICON NITRIDE MATERIALS
HEAT TO 1500°–1700° C FOR 15–60 MINUTES TO MELT BONDING COMPOSITION
COOL AND RECOVER BONDED ASSEMBLY

1. A method of joining silicon nitride materials to form a thermally matched bond containing oxynitrides which comprises:

a. providing a glass or ceramic bonding composition capable of providing oxynitrides when melted in contact with silicon nitride;

b. placing said bonding composition between the materials to be joined;

c. heating said composition and materials to a temperature sufficient to melt the composition;

d. maintaining said temperature for a time period sufficient to permit a portion of said materials to react with said melted composition;

e. thereafter cooling the joined materials to recover bonded assembly.

4,347,090

PROCESS FOR FORMING LAMINATED PIPE

Edward P. Anderson, Mickleton, N.J., and Donald G. Curran, Norwood, Pa., assignors to Bunnell Plastics, Inc., Mickelton, N.J.

Filed Oct. 24, 1980, Ser. No. 200,263
Int. Cl.³ B32B 31/26
U.S. Cl. 156—149 20 Claims

1. A process for forming a laminated tubular structure which comprises:

(a) applying a sleeve of a fabric about a tube of thermoplastic polymer,

(b) inserting a plug into each end of said liner to seal the interior of said liner from the surrounding atmosphere, at least one of said plugs having pressure relief valve means to prevent the pressure of vaporized liquid within said

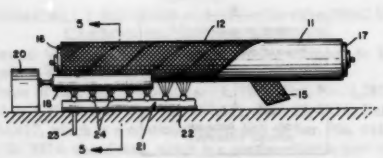
liner from exceeding a given value upon heating said liner and sleeve to elevated temperatures,

(c) introducing to said liner a liquid which is chemically inert with respect to said liner and has a boiling point substantially below the melting point of said thermoplastic polymer,

(d) applying heat to an arcuate portion of the outer surface of said liner through said sleeve while rotating said liner and sleeve, the time of heating and the rates of application of heat and rotation of said liner and sleeve being such as to cause the exterior surface of said liner to melt and volatilization of a portion of said liquid to create a pressure within said liner which exceeds the pressure of the atmosphere external of said liner to cause said liner to expand radially whereby the molten exterior surface thereof enters into the interstices of said fabric, said liquid within said liner providing a temperature gradient across the wall of said liner whereby the inner surface thereof remains solid and self-supporting, and

(e) cooling said liner to solidify the exterior surface thereof to produce a permanent mechanical bond between said sleeve and the outer surface of said liner.

15. A process for forming a corrosion-resistant laminated tubular structure which comprises:



(a) applying a sleeve of glass fabric about a seamless tube of thermoplastic fluorinated polymer,

(b) inserting a plug into each end of said liner to seal the interior of said liner from the surrounding atmosphere, at least one of said plugs having pressure relief valve means to prevent the pressure of vaporized liquid within said liner from exceeding a predetermined value upon heating said liner and sleeve to elevated temperatures,

(c) introducing water to said liner,

(d) rotating said liner and sleeve about a substantially horizontal axis, and applying heat to an arcuate portion of the outer surface of said liner through said sleeve, the time of heating and the rates of application of heat and rotation of said liner and sleeve being such as to cause the exterior surface of said liner to melt the volatilization of a portion of said water to create a pressure of from about 0.1 to about 10 psig within said liner, to cause said liner to expand radially whereby the molten exterior surface thereof enters into the interstices of said fabric, said water within said liner providing a temperature gradient across the wall of said liner whereby the inner surface thereof remains solid and self-supporting, and

(e) cooling said liner to solidify the exterior surface thereof to produce a permanent mechanical bond between said sleeve and the outer surface of said liner.

4,347,091

APPARATUS FOR THE PRODUCTION OF JACKETS FOR RECORDING DISKS

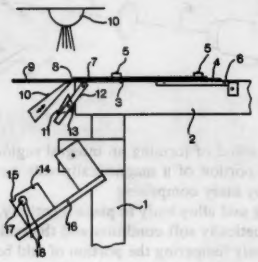
Karl Hauck, Maxdorf; Hubert Fehrenbach, Kehl; Dieter Mayer; Herbert Wagner, both of Ludwigshafen, and Kurt Zwintzscher, Willstaett, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 15, 1981, Ser. No. 254,259

Claims priority, application Fed. Rep. of Germany, May 12, 1980, 8012859[U]

Int. Cl.³ B09D *23/10*

U.S. Cl. 156—217 **7 Claims**



1. In an apparatus for the production of a jacket for a recording disk from a foldable blanket of plastic material, comprising a stationary surface provided with positioning elements for receiving one-half of the blank, at least one sheet-like spacer member extending the length of the fold to be made and having an edge serving as a folding blade, means for positioning said spacer member on said stationary surface, means having a surface for bending the other half of the blade, through an angle of 180°, over said spacer member and said one-half of the blank, and means for heating the fold area of the blade incident to said folding,

the improvement that, for minimizing the outward buckling of the jacket as a result of the residual restoring force of the plastic material at the fold, there are provided after treatment means including:

a bar extending parallel to the folding blade of the spacer member and having a groove whose cross-sectional shape corresponds to that of the external diameter of the completed jacket,

heat-producing means in said bar which are connectable to a source of energy, and

means for moving said bar towards and away from the folding blade.

4,347,092

PANTY LINER

James J. Hlaban, Neenah; Herbert E. Grube, and Paul S. Woon, both of Appleton, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 27, 1980, Ser. No. 153,210

Int. Cl.³ B31F *23/10*

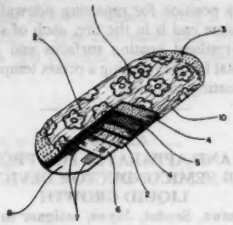
U.S. Cl. 156—227 **1 Claim**

1. A process for eliminating the delamination of the ends of a sanitary napkin having a fluid impervious baffle, an absorbent pad and a fluid permeable wrap said absorbent pad and said cover being coterminous and adhesively attached by a water soluble adhesive comprising:

(a) folding said wrap and said pad along its longitudinal axis to produce a double thickness of said absorbent pad with said wrap surrounding said folded pad and the longitudinal edges of the wrapped pad being closely adjacent each other;

(b) attaching said baffle to said wrapped pad over said longitudinal edge, said baffle being coterminous with said

folded wrapped pad so that each end of the napkin has a coterminous folded layer of said absorbent pad and wrap and the end of said baffle;



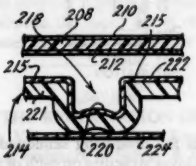
(c) moistening each of said ends;
(d) applying a water based emulsion adhesive to said ends;
(e) subjecting said ends to compressive force.

4,347,093

METHOD OF PRODUCING AN INTEGRATED SOLAR ROOF SYSTEM

Alfred M. Mayo, and Charles C. Convers, both of Dallas, Tex., assignors to Pure Power Incorporated, Dallas, Tex.

Division of Ser. No. 939,664, Sep. 5, 1978, Pat. No. 4,299,202. This application Aug. 17, 1981, Ser. No. 293,312
Int. Cl.³ F23J 3/02
U.S. Cl. 156—242 14 Claims



1. A method of producing a liquid absorber assembly for use in a liquid solar collector panel, the absorber assembly being a relatively thin, generally rectangular structure and having channels for the flow of liquid therethrough, the channels being defined between staggered buttons defining circuitous channels through which the liquid flows from one edge of the absorber to an opposite edge, the method comprising the steps of:

forming a casting plate of a configuration complementary to the buttons and channels of the absorber assembly with slots extending along opposite side edges of the casting plate for the receipt of inlet and outlet manifolds;

placing inlet and outlet manifolds in the slots along the opposite side edges of the casting plates, the manifolds each having openings for the flow of liquid to and from the channels represented by ridges of the casting plate;

applying a curable plastic material over substantially the entire surface of the casting plate having the complementary configuration and partially up the facing sides of the manifolds for substantially the full length of each so as to partially embed the manifolds in the plastic, at least that portion of the plastic adjacent the surface of the casting plate being impervious to the liquid to flow through the absorber assembly;

allowing the plastic to at least partially cure and then removing the plastic layer defining a lower sheet of the absorber assembly from the casting plate;

forming an upper sheet of the absorber assembly of a generally flat sheet material impervious to the passage of the liquid therethrough;

applying a light-absorptive coating to one side of the upper sheet so as to extend over substantially the entire sheet;

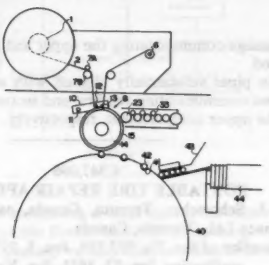
bonding the other side of the upper sheet to the tops of the buttons of the lower sheet with the channels for the liquid defined between the buttons and between the upper and lower sheets.

4,347,094

LABEL APPLYING APPARATUS

Shinichiro Watanabe, Tokyo, Japan, assignor to Sawara Mfg. Works Co., Ltd. and Fukushima Printing Industries Co., Ltd., both of Tokyo, Japan

PCT No. PCT/JP79/00268, § 371 Date Dec. 5, 1980, § 102(e) Date Aug. 13, 1980, PCT Pub. No. WO80/02131, PCT Pub. Date Oct. 16, 1980
PCT Filed Oct. 23, 1979, Ser. No. 219,308
Claims priority, application Japan, Apr. 5, 1979, 54-41413; May 4, 1979, 54-54303
Int. Cl.³ B65C 9/18, 9/46
U.S. Cl. 156—387 11 Claims



1. Apparatus for applying labels to articles, comprising:

elongated carrier means comprising a strip for supporting a plurality of discontinuous labels which are adapted to releasably adhere to said strip by an adhesive on one surface thereof;

supply and take-up rolls for said elongated carrier means;

label turnout and separator means for separating said labels from said strip intermediate of said supply and take-up rolls to charge said labels with static electricity by friction created by peeling said lables from said strip, so that said labels are attracted by said static electricity to an electrically charged roller whose periphery is dielectric, with the adhesive surfaces of said labels turned out, thereby supplying said labels to the next station;

means for applying said labels to said articles; and

means disposed between said label turnout and separator means and said label applying means for interposing printed indicia between said adhesive surface of said labels and said articles to be labelled.

4,347,095

ADHESIVE APPLICATOR

Kyoichi Yamashita, 2361 Nippa-cho, Kohoku-ku, Yokohama-shi, Kanegawa 223, Japan

Filed Jan. 16, 1981, Ser. No. 225,547
Claims priority, application Japan, Jan. 16, 1980, 55-2629
Int. Cl.³ B05C 1/00
U.S. Cl. 156—578 7 Claims

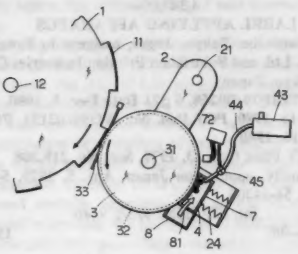
1. An apparatus for supplying an adhesive to a cylindrical drum rotatable about a vertical axis for applying the adhesive to an object, the apparatus comprising:

a container disposed in close contact with the drum and having a curved wall extending parallel and adjacent to the circumference of said drum;

first and second compartments defined in said container, juxtaposed downstream and upstream with respect to the direction of rotation of said drum, and exposed to said drum through openings in said curved wall, the downstream side walls of the first and second compartments

intersecting with the curved wall to define scraping edges, respectively;

an upper compartment defined in said container over said first and second compartments;



a passage communicating the upper and first compartments; and

drain pipes substantially aligned with said scraping edges and communicating the first and second compartments to the upper compartment, respectively.

4,347,096

PORTABLE TIRE REPAIR APPARATUS

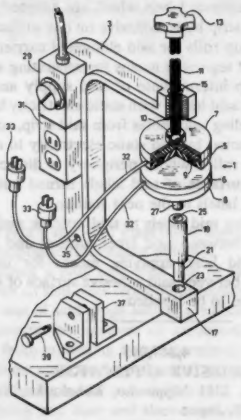
John J. Schorscher, Toronto, Canada, assignor to Tip Top Remaco Ltd., Toronto, Canada

Continuation of Ser. No. 912,199, Jun. 5, 1978, abandoned. This application Jun. 12, 1981, Ser. No. 273,181

Claims priority, application Canada, Apr. 24, 1978, 301840

Int. Cl.³ B29H *5/16*; B30B *15/34*

U.S. Cl. 156—583.3 **3 Claims**



1. A portable tire repair apparatus comprising an open sided frame having interior and exterior free frame ends, opposing interior and exterior heating elements supported from said interior and exterior frame ends respectively, means for moving the exterior heating element to adjust the distance between said heating elements and for clamping a damaged tire portion therebetween and support means at said interior frame end for supporting said interior heating element in an operating position, said support means comprising a shank of fixed length for spacing said interior heating element away from said interior frame end to a position for gaining access to essentially all areas on the inner surface of the tire when in said operating position and a socket at said interior frame end for seating said shank, said shank being slidable out of and back into said socket for readily removing said shank and interior heating element from said frame to fit said interior frame end into the tire and for readily replacing said shank and interior heating element in said socket in a position for repairing sidewall damage when said interior frame end is in the tire, each of said heating elements having resilient heating surfaces and being provided with a thermostat for maintaining a preset temperature range at said resilient heating surfaces.

4,347,097

METHOD AND APPARATUS FOR PRODUCING A MULTILAYER SEMICONDUCTOR DEVICE UTILIZING LIQUID GROWTH

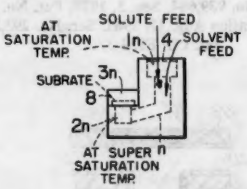
Jun-ichi Nishizawa, Sendai, Japan, assignor to Handotai Kenkyu Shinkokou, Sendai, Japan

Continuation of Ser. No. 862,998, Dec. 21, 1977, abandoned, which is a continuation-in-part of Ser. No. 561,092, Mar. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 314,448, Dec. 12, 1972, abandoned. This application Aug. 14, 1980, Ser. No. 177,864

Claims priority, application Japan, Dec. 14, 1971, 46-100622; Fed. Rep. of Germany, Dec. 13, 1972, 2260980; United Kingdom, Dec. 13, 1972, 57380/72

Int. Cl.³ C30B *19/06*

U.S. Cl. 156—622 **27 Claims**



1. An apparatus for producing semiconductor devices by depositing a multi-layer structure on each of a given number of substrates by utilizing liquid growth, comprising:

a boat having a plurality of first holes arranged in sequence thereon and a plurality of second holes which are provided at higher positions than those of the first holes and interconnected by solutes respectively to the first holes during the deposition of epitaxial layers,

means for heating the solutes in the second holes to higher temperatures than those of the solutes in the first holes to effect a selected temperature difference in said interconnected first and second holes during and continuously between the deposition of epitaxial layers;

sliding plates coupled to the boat for successively shifting the substrate held thereon on and close to the first holes, and

means for guiding said movable plates in only one given direction for a given number of times to grow said multilayers on a given number of substrates successively and for keeping said substrates contacting said solutions for each of given time intervals.

4,347,098

SOLVENT VAPOR RECOVERY FROM A POLYMER SOLUTION

John S. Hubby, Cronulla, Australia, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 14, 1980, Ser. No. 177,956

Int. Cl.³ B01D *1/14*

U.S. Cl. 159—16 S **10 Claims**

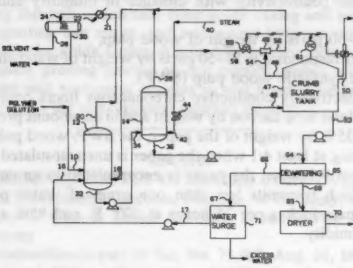
1. Apparatus comprising:

a first polymer receiving vessel having a product inlet, a steam inlet, a product outlet and a vapor outlet;

a second polymer receiving vessel having a product inlet in

flow communication with the product outlet of the first polymer receiving vessel, a product outlet and a first vapor outlet;

a third polymer receiving vessel having a product inlet, a product outlet in flow communication with the product inlet of the first polymer receiving vessel, and a vapor outlet;



means for fluid flow between the vapor outlet of the first polymer receiving vessel and the third polymer receiving vessel;

vapor recovery means having a vapor inlet in flow communication with the first vapor outlet of the second polymer receiving vessel and a vapor outlet in flow communication with the third polymer receiving vessel via the means for fluid flow between the vapor outlet of the first polymer receiving vessel and the third polymer receiving vessel.

4,347,099

PROCESS FOR THE RECLAMATION OF WASTE PAPER

Jean De Ceuster, Vilvoorde, and Paul Essemaeker, Brussels, both of Belgium, assignors to Solvay & Cie., Brussels, Belgium

Continuation of Ser. No. 758,869, Jan. 12, 1977, abandoned. This application Nov. 17, 1980, Ser. No. 207,761

Claims priority, application Luxembourg, Jan. 16, 1976, 74199; Aug. 4, 1976, 75528

Int. Cl.³ D21C *5/02*

U.S. Cl. 162—5 **33 Claims**

1. A process for the reclamation of waste paper comprising contacting the waste paper with an aqueous alkaline solution which contains at least one hydroxycarboxylated polymer, said hydroxycarboxylated polymer comprising a main carbon chain substituted by carboxy groups —COOM where M represents a substituent selected from the group consisting of hydrogen, an alkali metal atom and an ammonium group to deink fibers of the waste paper, and producing a paper from the deinked fiber.

4,347,100

STRENGTH OF PAPER FROM MECHANICAL OR THERMOMECHANICAL PULP

Albert Brucato, Seattle, Wash., assignor to The Chemithon Corporation, Seattle, Wash.

Filed May 21, 1981, Ser. No. 265,811

Int. Cl.³ D21B *1/16*

U.S. Cl. 162—10 **24 Claims**

1. A method of improving the bursting strength of paper made from mechanical or thermomechanical pulp which comprises incorporating into mechanical or thermomechanical pulp at an elevated temperature and pressure an anionic organic surface active agent in an amount sufficient to improve the bursting strength of the paper subsequently formed from the pulp.

4,347,101

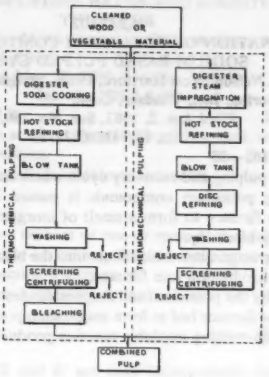
PROCESS FOR PRODUCING NEWSPRINT

Eduardo J. Villavicencio, Mexico City, Mexico, assignor to W. R. Grace & Co., New York, N.Y.

Filed Nov. 24, 1980, Ser. No. 210,057

Int. Cl.³ D21C *1/02, 3/26*

U.S. Cl. 162—25 **12 Claims**



1. A method for producing a high quality newsprint pulp from wood or vegetable fibrous material comprising:

(a) providing a quantity of said fibrous material in a form suitable for input into a digester;

(b) (i) conveying at least forty percent by weight of said quantity of fibrous material to a thermochemical digester and contacting said fibrous material with an alkaline cooking liquor whereby lignin is removed from said fibrous material and said fibrous components;

(ii) after digesting said fiber for from 0.1 to 1 hour at 140° C. to 190° C., refining the digested fiber at above 100° C.;

(iii) rapidly reducing the pressure on said digested and refined fibers to approximately ambient pressure and washing and screening said fiber to remove pulping chemicals and dirt and other foreign fragments therefrom; and

(iv) contacting said washed and screened fibers with a bleachant for a time sufficient to raise the GE brightness of said fibers to greater than about 60;

(c) (i) conveying the remainder of said quantity of fibrous material to a thermomechanical digester which consists of a first section and a second section, said sections being separated by a refiner;

(ii) contacting said fibrous material within the first section, of said thermomechanical digester with steam at a pressure greater than about 2 kg/sq. cm and mechanically working said fiber in said section of the digester to partially reduce said fibrous material to its fiber components;

(iii) conveying the fibrous material from the first section of said digester to a refiner and refining said fibrous material;

(iv) contacting the refined fiber in a second section of said thermomechanical digester with steam at a pressure of less than about 2 kg/cm^2, whereby said fibrous material is substantially reduced to its fiber components;

(v) refining the digested fiber and rapidly reducing the pressure on the digested fiber to approximately ambient pressure; and

(vi) refining said digested and elevated pressure refined fibers at ambient pressure; and washing and screening the refined fibers to remove dirt and large fiber fragments therefrom;

(d) intermixing the bleached fiber from thermochemical

digestion with the fiber from thermomechanical digestion; and;

(e) producing a newsprint paper from such intermixed fibers.

4,347,102

ELIMINATION OF POTASSIUM COMPOUNDS FROM SODIUM-BASED PULPED CYCLES

Hugh W. Nelson, West Hartford, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 2, 1981, Ser. No. 250,346
Int. Cl.³ D21C *11/12*
U.S. Cl. 162—35 3 Claims

1. In a pulping and recovery cycle where heavy black liquor including potassium compounds is passed into a chemical recovery furnace to form a smelt of inorganic material from the heavy black liquor,

passing magnesium nesosilicate into the black liquor prior to its introduction into furnace,

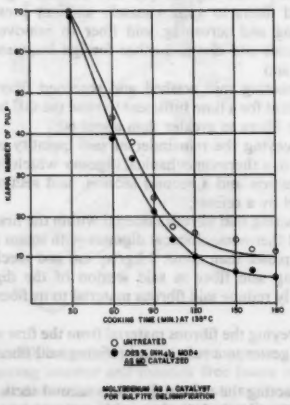
whereby the potassium and magnesium nesosilicate combine in the furnace bed to form magnesium potassium silicate as a high-melting insoluble reaction product.

4,347,103

METHOD FOR SULFITE PULPING USING WATER-SOLUBLE MOLYBDENUM-CONTAINING COMPOUNDS AS CATALYSTS

Dominic S. Rende, Woodridge, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Jul. 14, 1980, Ser. No. 168,923
Int. Cl.³ D21C *3/00, 3/06*
U.S. Cl. 162—79 3 Claims



1. An improved method for sulfite pulping of wood chips in which wood chips are digested in a sulfite pulping liquor to produce a wood pulp, the improvement comprising adding to the sulfite pulping liquor prior to digesting the wood chips a pulping catalyst consisting essentially of 0.0025–0.100 weight percent of a water-soluble molybdenum-containing compound based on the weight of the wood chips, and pulping the wood to a Kappa No. below 15 using said water-soluble molybdenum-containing sulfite pulping liquor.

4,347,104

MOISTURE-INSENSITIVE ELECTRICALLY-CONDUCTIVE PAPER

Daryl D. Dressler, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 18, 1979, Ser. No. 40,417
Int. Cl.³ D21H *1/02*
U.S. Cl. 162—103 6 Claims

1. Electrically-conductive paper which has little change in electrical conductivity with changes in humidity and comprises

(1) 2–50 parts by weight of wood pulp,

(2) correspondingly 98–50 parts by weight of water-dispersible synthetic wood pulp (SWP),

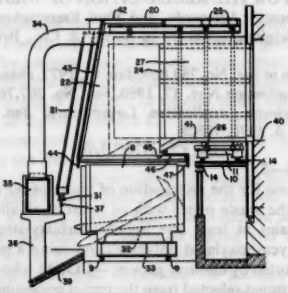
(3) electrically conductive carbonaceous fibers comprising at least 80% carbon by weight and in an amount providing 1–35% by weight of the paper, the SWP/wood pulp ratio being at least 4:1 when the paper is unencapsulated and at most 9:1 when the paper is encapsulated in an envelope which transmits less than one gram of water per 100 square inches per 24 hours at 100° F. and 95% relative humidity.

4,347,105

COKE SIDE GANTRY CAR FOR A BATTERY OF COKE OVENS

Hans-Jurgen Kwasnik, Herne, and Hans-Gunter Piduch, Bochum, both of Fed. Rep. of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Filed Nov. 12, 1980, Ser. No. 205,893
Int. Cl.³ C10B *5/00*
U.S. Cl. 202—263 3 Claims



1. Apparatus adapted to traverse along a platform at the coke side of a coke oven battery in a generally parallel relation therewith and generally parallel with movement of a hot coke car along tracks below said platform, said apparatus including the combination of a gantry car to move along the coke side of said coke oven battery, said gantry car supporting a coke oven door extractor, a coke oven door cleaner, a coke oven door frame cleaner, and a hood to collect emissions during pushing of coke from an oven chamber, said hood having a horizontal opening overlying said hot coke car, at least two gantry support rails, one rail being arranged to extend along said platform and the other rail being arranged to extend along outwardly beyond said tracks to support said gantry car for traversing movement, a coke guide grading for directing hot coke from an oven chamber above said platform into said hot coke car, a coke guide casing having continuous rigid side walls enclosing said coke guide grading and spanning the distance between an

oven chamber and said hood, means including an overhead rail supported by said gantry car to extend within said hood for suspended support of said coke guide casing and said coke guide grading and for movement thereof on said gantry car in an axial direction of a coke oven chamber in said battery between a coke-guiding position interconnecting the oven chamber opening with said hood and a retracted position where said coke guide casing and said coke guide grading extend into said hood whereby said other rail receives a substantial part of the weight thereof from said gantry car, said hood having an opening through which said coke guide casing and said coke guide grading can move, and seal means between said hood and said coke guide casing in said coke-guiding position, said coke guide grading having an end portion within said hood engaging said horizontal opening in said hood in sealing relation when in the coke-guiding position thereof.

4,347,106

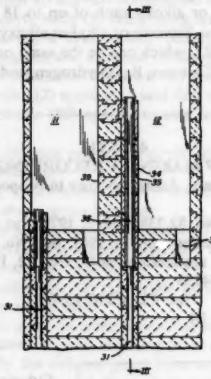
REGENERATIVELY-OPERATED COKE OVEN

Folkard Wackerbarth, Bochum, Fed. Rep. of Germany, assignor to Dr. C. Otto & Comp. G.m.b.H, Bochum, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 71,607, Aug. 31, 1979, abandoned. This application Apr. 1, 1981, Ser. No. 249,811

Int. Cl.³ C10B *1/06, 5/12, 21/00*

U.S. Cl. 202—141 **8 Claims**



1. Apparatus for supplying non-preheated gas to heating flues between oven chambers of a regeneratively-heated coke oven, said apparatus including burners projecting into said heating flues, said burners having a lining forming a gas-conducting wall surface consisting of a refractory material capable of withstanding temperatures of at least 1000° C. and defining a smoothness sufficient to substantially prevent accretion of carbon on said wall surface at said temperatures.

4,347,107

ELECTROPLATING TIN AND TIN ALLOYS AND BATHS THEREFOR

Robert J. Teichmann, Belleville, and Linda J. Mayer, Denville, both of N.J., assignors to Hooker Chemicals & Plastics Corp., Warren, Mich.

Filed Apr. 2, 1981, Ser. No. 250,373

Int. Cl.³ C25D *3/60*

U.S. Cl. 204—44 **21 Claims**

1. An aqeous electroplating bath for the deposition of bright metallic tin or alloys of tin with copper or rhodium which comprises a bath soluble divalent tin compound in an amount sufficient to deposit tin on the substrate being plated, an inorganic acid in an amount sufficient to maintain the bath pH not in excess of about 2.0, a brightening amount of an aromatic amine brightener, a nonionic surfactant, and a sufficient amount of an aromatic sulfonic acid to maintain the stability of the plating bath and enhance the brightness of the electrodeposit.

4,347,108

ELECTRODEPOSITION OF COPPER, ACIDIC COPPER ELECTROPLATING BATHS AND ADDITIVES THEREFOR

William J. Willis, North Royalton, Ohio, assignor to Rohco, Inc., Cleveland, Ohio

Filed May 29, 1981, Ser. No. 268,645

Int. Cl.³ C25D *3/38*

U.S. Cl. 204—52 R **23 Claims**

1. An aqueous acidic copper electroplating bath containing as essential ingredients:

(A) one or more bath-soluble copper salts,

(B) free acid,

(C) chloride ions,

(D) an effective amount of one or more bath-soluble nitrogen and sulfur-containing brightening compounds prepared by reacting a mixture of

(a) a disulfide having the formula

$$[RR'NCS_2]_2 \qquad \text{(Formula I)}$$

wherein R and R′ are each independently hydrogen, alkyl or aryl groups,

(b) a halo hydroxy sulfonic acid having the formula

$$X(CH_2)_nCH(OH)CH_2SO_3M \qquad \text{(Formula II)}$$

wherein X is a halogen, n is one or two and M is hydrogen or an alkali metal,

(c) an aliphatic aldehyde having up to three carbon atoms in

(d) an aqueous alkaline medium, and

(E) one or more heterocyclic sulfur-nitrogen compounds selected from the group consisting of

(e) 2-thiazolidinethione and its lower alkyl derivatives,

(f) 2-imidazolidinethione and its lower alkyl derivatives, and

(g) bath-soluble reaction products of (e) or (f) with an alkyl aldehyde or dialdehyde.

22. An additive composition for aqueous acidic copper electroplating baths comprising an aqueous mixture of

(A) one or more bath-soluble brightening compounds prepared by reacting a mixture of

(a) a disulfide having the formula

$$[RR'NCS_2]_2 \qquad \text{(Formula I)}$$

wherein R and R′ are each independently hydrogen, alkyl or aryl groups,

(b) a halo hydroxy sulfonic acid having the formula

$$X(CH_2)_nCH(OH)CH_2SO_3M \qquad \text{(Formula II)}$$

wherein X is a halogen, n is one or two and M is hydrogen or an alkali metal,

(c) an aliphatic aldehyde having up to three carbon atoms in,

(d) an aqueous alkaline medium, and

(B) one or more heterocyclic sulfur-nitrogen compounds selected from the group consisting of

(e) 2-thiazolidinethione and its lower alkyl derivatives,

(f) 2-imidazolidinethione and its lower alkyl derivatives, and

(g) bath-soluble reaction products of (e) or (f) with an alkyl aldehyde or dialdehyde, and

(C) at least one non-ionic wetting agent.

4,347,109
METHOD FOR MAKING ACETALDEHYDE FROM ETHANOL

Thomas M. Meshbesher, Edina, Minn., assignor to Electrohol Corporation, Edina, Minn.

Filed Oct. 23, 1980, Ser. No. 199,939
Int. Cl.³ C25B 3/02, 8/00; C07C 45/29
U.S. Cl. 204—5.9 R 12 Claims

1. A method for making acetaldehyde from ethyl alcohol comprising the steps of:

(a) bringing an ethyl alcohol-containing fuel into contact with an anode of a fuel cell, which fuel cell includes the anode, a cathode, an electrolyte within the cell, and external circuit means electrically connecting the cathode to the anode, exterior to the fuel cell; and bringing an oxidant into contact with the cathode;

(b) anodically treating said fuel by electrochemically oxidizing the ethyl alcohol to acetaldehyde at the anode, thereby producing a flow of current in the external circuit means at a voltage in the circuit means from about 1 to 1000 millivolts;

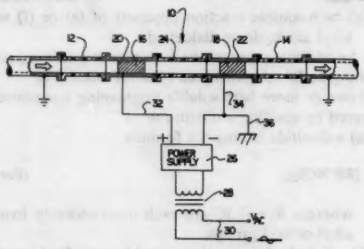
(c) taking at least the products of the resulting anodically treated fuel out of the oxidation reaction to avoid the formation of condensates or more highly oxidized products at the anode; and

(d) recovering a major amount of the thus-produced aldehyde.

4,347,110
METHOD FOR TALL OIL RECOVERY AND APPARATUS THEREFOR

Edward R. Joyce, and William L. Smith, both of Jacksonville, Fla., assignors to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 168,375, Jul. 10, 1980, abandoned. This application Nov. 25, 1980, Ser. No. 210,221
Int. Cl.³ C02F 1/46, 1/48; C25B 9/00; B03C 5/00
U.S. Cl. 204—149 12 Claims



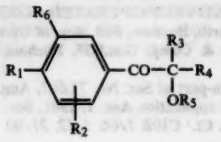
12. A method for enhancing the extent of removal of dispersed particles of tall oil soap in a flowing confined stream of black liquor which comprises passing said stream of black liquor in contact first with a positively charged first electrode and then with a negatively charged second electrode to agglomerate said particles into larger particles said electrodes being maintained in electrical isolation one from the other, and said positively charged electrode being maintained in electrical isolation to earth ground, applying a positive D.C. potential to said positively charged electrode relative to earth ground, and applying a negative D.C. potential relative to said positively charged electrode by absorbing electrons from said second electrode into earth through a conductor electrically connected to the earth.

4,347,111
PHOTOSENSITIVE HYDROXYALKYLPHENONES

Jürgen Gehlhaus, Heppenheim, and Manfred Kieser, Darmstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 906,505, May 16, 1978, abandoned. This application Nov. 26, 1979, Ser. No. 99,792
Claims priority, application Fed. Rep. of Germany, May 17, 1977, 2722264
Int. Cl.³ C08F 2/50; B32B 27/16
U.S. Cl. 204—159.16 21 Claims

1. A method of photopolymerizing a photopolymerizable composition which comprises irradiating, with effective radiation, a composition comprising at least one photopolymerizable unsaturated compound and a photosensitizingly effective amount of at least one compound of formula (I)



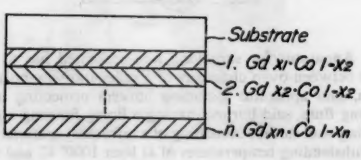
(I)

wherein R_1 is hydrogen, chlorine, phenyl, diaklylamino of 2–4 C-atoms or alkyl or alkoxy each of up to 18 C-atoms; R_2 is hydrogen, chlorine, bromine or alkyl or alkoxy each of up to 4 C-atoms; R_3 and R_4, which can be the same or different, each is alkyl of up to 6 C-atoms; R_5 is hydrogen; and R_6 is hydrogen or methyl.

4,347,112
METHOD OF MAKING A RECORDING MEDIUM

Yuji Togami, Isehara, Japan, assignor to Nippon Hoso Kyokai, Tokyo, Japan

Division of Ser. No. 82,238, Oct. 5, 1979, Pat. No. 4,293,621. This application Apr. 16, 1981, Ser. No. 254,636
Claims priority, application Japan, Oct. 12, 1978, 53-125298; May 4, 1979, 54-54153
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 M 6 Claims



1. A method of forming a recording medium for magnetically recording a binary code signal comprising forming an amorphous magnetic layer consisting of at least a rare earth metal and an iron family metal, forming said amorphous magnetic layer as a plurality of thin amorphous magnetic layers stacked on each other, causing the composition ratio between the rare earth metal and the iron family metal in each of said thin layers to be different from the composition ratio in an adjacent one of said thin layers and causing the thickness of a first one of said plurality of amorphous magnetic thin layers which has a larger perpendicular magnetic anisotropy to be larger than the thickness of a second adjacent one of said amorphous magnetic thin layers which has a smaller perpendicular magnetic anisotropy, said amorphous magnetic layer enabling said recording medium to magnetically and thermally stably record a binary code signal even if the diameter of a recorded information bit is on the order of one micrometer.

4,347,113
OXYGEN CONTENT EXHAUST GAS SENSOR, AND METHOD OF ITS MANUFACTURE

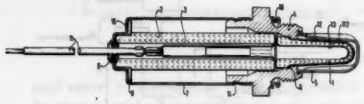
Hermann Fischer, Stuttgart; Karl-Hermann Friese, Leonberg; Hans-Ulrich Gruber, Gerlingen; Wolfgang Heinemann, Weissach; Günter Knoll, Stuttgart; Ernst Linder, Mühlacker; Helmut Maurer, Schwieberdingen; Rainer Noack, Markgröningen; Leo Steinke, Waiblingen-Hegnach; Lothar Weber, Stuttgart, and Helmut Weyl, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 25, 1980, Ser. No. 133,811

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1979, 2913633

Int. Cl.³ G01N *27/58*

U.S. Cl. 204—195 S **18 Claims**



1. Electrochemical sensor to determine the oxygen content in gases resulting from a combustion process, particularly exhaust gases from an internal combustion engine having

a solid electrolyte body (1) comprising stabilized zirconium dioxide, having a first surface portion exposed to the combustion gases, and a second surface portion exposed to a reference substance of known oxygen concentration;

a first electrode (12) applied to said first surface portion;

a second electrode (13) applied to said second surface portion;

and a porous ceramic protective cover layer (112) covering the first electrode,

and wherein, in accordance with the invention, the electrodes are characterized in that

the first electrode comprises a mixture of powdery ceramic material, forming a support structure or support lattice, and a platinum-rhodium alloy;

and the second electrode comprises an alloy of palladium and another noble metal.

11. Method to make an electrochemical sensor to determine the oxygen content in gases resulting from a combustion process, particularly the exhaust gases from an internal combustion engine, having a solid electrolyte body (1) comprising stabilized zirconium dioxide and having a first surface portion exposed to the gases and a second surface portion exposed to a reference substance of known oxygen concentration;

a first electrode (12) applied to said first surface portion;

a second electrode (13) applied to the second surface portion;

and a porous ceramic protective cover layer (112) covering the first electrode, said method comprising the steps of

1. providing a presintered solid electrolyte body comprising stabilized zirconium dioxide;

1.1 applying a platinum-rhodium alloy and powdery ceramic material to said first surface to form the first electrode, shaped in form of a conductive track;

1.2 applying a palladium-platinum alloy on the second surface to form the second electrode, shaped in form of a conductive track;

2. sintering the solid electrolyte body with the electrode layers applied thereto at a temperature of between about 1400° to 1700° C.;

3. supplying a layer of a noble metal or a mixture of noble metals over at least said second electrode and covering the second electrode at least in part,

said noble metal or mixture of noble metals comprising at least one of the materials of the group of consisting of

3.1 noble metal alloys dissolved in water or organic solvents;

3.2 colloidal noble metal suspension;

3.3 powdered noble metal suspension;

4. sintering the layer of step 3 at a temperature of between about 800° C. to 1300° C.; and

5. applying the porous ceramic protective covering layer (112).

4,347,114
FLAT THIN FILM TYPE OXYGEN SENSOR

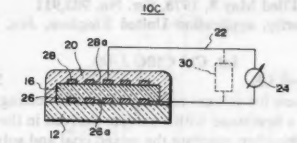
Shinji Kimura, Yokohama; Hiroshi Takao, Kamakura; Satoshi Ambe, Yokosuka, and Yoshio Akimune, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 23, 1980, Ser. No. 162,001

Claims priority, application Japan, Jun. 26, 1979, 54-79736

Int. Cl.³ G01N *27/58*

U.S. Cl. 204—195 S **6 Claims**



1. An oxygen sensor comprising:

(a) an oxygen ion conductive solid electrolyte layer;

(b) an electronically conductive reference electrode layer having a plurality of openings therein, said electrode layer being in intimate contact with one side of said electrolyte layer, said solid electrolyte layer extending through said openings;

(c) a partition layer of an electrochemically inactive material in intimate contact with the other side of said electrode layer, said electrolyte layer joining said partition layer through said openings in said reference electrode layer;

(d) an electronically conductive measurement electrode layer in intimate contact with the other side of said electrolyte layer, said measurement electrode layer having a plurality of openings therein;

(e) a porous protective layer in intimate contact with the other side of said measurement electrode layer, said porous protective layer extending through said openings in said measurement electrode layer, said protective layer contacting said electrolyte layer through said openings.

4,347,115
ELECTROPLATING APPARATUS

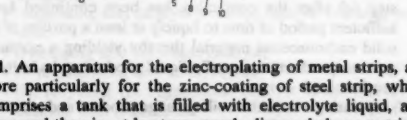
Manfred Espenhahn, and Manfred Folwaczny, both of Essen, Fed. Rep. of Germany, assignors to Thyssen Aktiengesellschaft vorm. August Thyssen-Hütte, Duisburg, Fed. Rep. of Germany

Filed May 1, 1981, Ser. No. 259,721

Claims priority, application Fed. Rep. of Germany, May 3, 1980, 3017079

Int. Cl.³ C25D *17/00, 17/10*

U.S. Cl. 204—206 **9 Claims**



1. An apparatus for the electroplating of metal strips, and more particularly for the zinc-coating of steel strip, which comprises a tank that is filled with electrolyte liquid, and, immersed therein, at least one anode disposed above a strip to

be electrolytically coated and at least one anode disposed below said strip, both of said anodes being parallel to said strip, the anode (4) disposed above the strip (7) being electrolytically consumable and made of an electrolytically depositable metal for deposition on said strip, and the anode (5) disposed below said strip (7) consisting essentially of a material that is insoluble in the electrolyte and not electrolytically consumable, each of said anodes being connected to a source of current, said anode (5) disposed below said strip being provided with means for disconnecting the same from said source of current.

4,347,116
TWO-STAGE COAL LIQUEFACTION

Darrell D. Whitehurst, Titusville; Thomas O. Mitchell, Trenton, and Malvina Farcasiu, Princeton, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 8, 1978, Ser. No. 903,911
Claims priority, application United Kingdom, Jun. 8, 1977, 23951/77
Int. Cl.³ C10G *1/00*
U.S. Cl. 208—8 LE 3 Claims

1. In a process for solvent refining of coal by mixing comminuted coal in a first stage with a solvent derived in the process as recited hereinafter, reacting the mixed coal and solvent in a second stage characterized by presence of hydrogen donor compounds, separating undissolved solids, and separately recovering from the product of reacting coal a solvent refined coal product of low melting point and a solvent fraction for mixing with comminuted coal in said first stage; the improvement which comprises separating from the mixture produced in said first stage a light fraction boiling below about 275° C. and containing compounds of about fourteen carbon atoms and less derived from said mixture, subjecting said light fraction to catalytic hydrogenation under conditions to reduce the monocyclic phenol content thereof and to convert polycyclic aromatic hydrocarbons to hydrogen donors, passing to said second stage the residue of solvent and coal from which said light fraction has been removed, and adding said hydrogenated light fraction to the reactants for said second stage.

4,347,117
DONOR SOLVENT COAL LIQUEFACTION WITH BOTTOMS RECYCLE AT ELEVATED PRESSURE

Richard F. Bauman, Houston; John W. Taunton, Seabrook; George H. Anderson, Houston; Ken L. Trachte, Baytown, and Steve J. Hsia, Friendswood, all of Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 106,068, Dec. 20, 1979, abandoned. This application Nov. 3, 1980, Ser. No. 203,410
Int. Cl.³ C10G *1/00, 1/06*
U.S. Cl. 208—8 LE 25 Claims

1. A process for liquefying coal and similar solid carbonaceous materials comprising the steps of:

(a) contacting the solid carbonaceous material, a solvent or diluent containing at least 0.8 wt % donatable hydrogen and at least about 10 wt % naphthenic components at a temperature within the range from about 700° to about 950° F. and at a pressure within the range from about 1750 to about 2800 psig;

(b) maintaining the contacting of step (a) for a nominal period of time sufficient to liquefy at least a portion of the solid carbonaceous material,

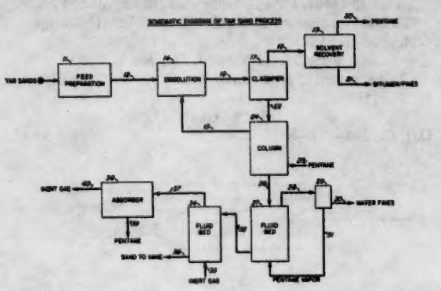
(c) separating the effluent resulting from the contacting of step (a) after the contacting has been continued for a sufficient period of time to liquefy at least a portion of the solid carbonaceous material thereby yielding a normally gaseous product, a normally liquid product and a bottoms product; and

(d) separating a naphtha boiling range product and a heavier boiling product from the liquid.

4,347,118
SOLVENT EXTRACTION PROCESS FOR TAR SANDS

Edward W. Funk; Walter G. May, both of Summit, and James C. Pirkle, Jr., Westfield, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Oct. 1, 1979, Ser. No. 80,454
Int. Cl.³ C10G *1/04*
U.S. Cl. 208—11 LE 8 Claims



1. A process for solvent extraction of bitumen from tar sands containing water and inorganic fines and recovering the solvent which comprises

mixing the tar sands in a dissolution zone with C_5 to C_6 hydrocarbon solvent having a normal boiling point of from about 25° to 60° C.;

maintaining the solvent to bitumen weight ratio in the dissolution zone at from about 0.5:1 to 1.5:1;

passing the resultant mixture to a classifier wherein an overflow of a viscous mixture of bitumen and inorganic fines is separated from an underflow of extracted sand, then passing the underflow of extracted sand through a countercurrent extraction column wherein the sand is further extracted;

introducing the extracted sand into a first fluid-bed drying zone fluidized by C_5 to C_6 hydrocarbon solvent vapors and heated to a drying temperature which is about 25° to 60° C. higher than the normal boiling point of said C_5 to C_6 hydrocarbon solvent, wherein unbound solvent is removed from extracted sand and the sand water content is lowered to less than about 2 wt.%; and

conducting the so-treated sand to a second fluid-bed drying zone fluidized by inert gas heated to a temperature of from 25° to 100° C. wherein bound solvent is removed.

4,347,119
HORIZONTAL OIL SHALE AND TAR SANDS RETORT

Delbert D. Thomas, 313 High St., Redlands, Calif. 92373

Filed Nov. 21, 1980, Ser. No. 208,946
Int. Cl.³ C10G *1/02;* C10B *47/18, 53/06*
U.S. Cl. 208—11 R 15 Claims

1. A method for retorting carbonaceous materials including tar sands and/or oil shale in a substantially horizontal retort comprising the steps of:

introducing carbonaceous material having varying proportions of tar sand and oil shale, into a substantially horizontal retort tube having a retort zone, said retort zone having an upstream end and a downstream end;

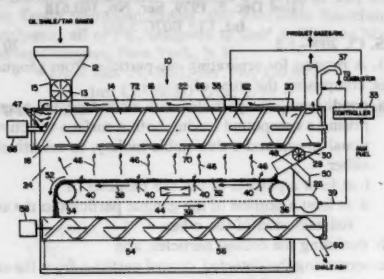
conveying said carbonaceous material substantially horizontally through said retort zone and simultaneously mixing said carbonaceous material;

heating said carbonaceous material in said retort zone to a temperature sufficient to pyrolyze said carbonaceous material to form product gases and oil and pyrolysis residue;

conveying the pyrolysis residue substantially horizontally beneath said retort zone while combusting any carbonaceous material in said pyrolysis residue to produce at least a portion of the heat for heating said retort tube, with the

amount of heat produced by such combustion varying with the composition of said carbonaceous material, said combustion also producing hot waste solids;

supplying additional fuel for combustion in the zone beneath



said retort to supplement the heat provided by the combusting of said carbonaceous material selectively to raise the temperature of the retort to the desired retorting levels; and

disposing of the waste combustion products.

4,347,120

UPGRADING OF HEAVY HYDROCARBONS

Ardis L. Anderson, and James R. McConaghy, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Dec. 22, 1980, Ser. No. 219,006

Int. Cl.³ C10B *47/00*; C01B *2/14*; C10G *13/22*

U.S. Cl. 208—50 **5 Claims**

1. A process for upgrading a heavy liquid hydrocarbonaceous material comprising:

(a) subjecting said heavy liquid hydrocarbonaceous material to a hydrogen donor diluent cracking step;

(b) fractionating the products from said cracking step and subjecting the bottoms stream from the fractionation to delayed coking;

(c) passing delayed coke to a top fed internally fired moving bed vertical shaft kiln;

(d) introducing combustion air into said kiln to provide a combustion zone;

(e) maintaining upward gas flow in said kiln and recovering flue gas including nitrogen from the top of the kiln;

(f) introducing steam to the lower portion of said shaft kiln whereby hydrogen is produced by reaction of steam with descending hot coke;

(g) recovering a substantially nitrogen-free hydrogen-rich gas stream from said shaft kiln from a level above the steam injection level and below the combustion air injection level; and

(h) utilizing hydrogen from said hydrogen-rich gas stream to hydrogenate hydrogen-depleted recycle donor solvent for use in said donor cracking step.

4,347,121

PRODUCTION OF LUBRICATING OILS

Jerome F. Mayer, San Anselmo; Stephen J. Miller, San Francisco, and Dennis J. O'Rear, Tiburon, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 9, 1980, Ser. No. 195,554

Int. Cl.³ C10G *11/05, 45/12, 49/08, 69/04*

U.S. Cl. 208—58 **12 Claims**

1. A process for preparing stable lubricant oil stocks, comprising:

(a) hydrocracking a hydrocarbonaceous feed to produce a hydrocrackate wherein the portion of said hydrocrackate which boils above about 200° C. has a total nitrogen content of less than 10 ppm by weight;

(b) stabilizing at least part of said hydrocrackate portion by catalytic hydrofinishing; and

(c) dewaxing all or part of the portion of said stabilized hydrocrackate which boils above about 200° C. by contacting said stabilized hydrocrackate fraction with a dewaxing catalyst comprising an intermediate pore size zeolite.

4,347,122

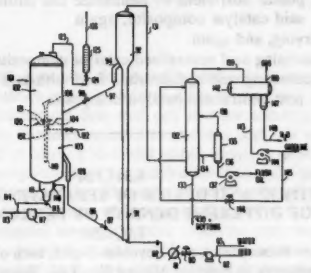
CARBO-METALLIC OIL CONVERSION WITH LIQUID WATER

George D. Myers, and Lloyd E. Busch, both of Ashland, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Nov. 14, 1979, Ser. No. 94,217

Int. Cl.³ C10G *11/18*

U.S. Cl. 208—113 **52 Claims**



1. A process for economically converting carbometallic oils to lighter products, comprising:

I. providing a converter feed containing 650° F.+ material, said 650° F.+ material being characterized by a carbon residue on pyrolysis of at least about 1 and by containing at least about 4 parts per million of Nickel Equivalents of heavy metal(s);

II. bringing said converter feed together with cracking catalyst having an equilibrium microactivity test conversion activity level of at least about 40 and bearing an accumulation of at least about 3000 ppm Nickel Equivalents of heavy metal(s) expressed as metal(s) by weight on regenerated equilibrium catalyst;

III. bringing said converter feed together with liquid water in a weight ratio relative to feed in the range of about 0.04 to about 0.15;

IV. forming a stream containing a mixture of said converter feed, said catalyst and steam resulting from the vaporization of said liquid water and causing the resultant stream to flow through a progressive flow type reactor having an elongated reaction chamber which is at least in part vertical or inclined at a lineal velocity of at least about 25 feet per second for a vapor residence time in the range of about 0.5 to about 10 seconds at a reaction chamber outlet temperature of about 975° to about 1300° F. and under a pressure of about 10 to about 50 pounds per square inch absolute sufficient for causing a conversion per pass in the range of about 60% to about 90% while producing coke in amounts in the range of about 6 to about 14% by weight based on fresh feed, and laying down coke on the catalyst in amounts in the range of about 0.3 to about 3% by weight;

V. separating said catalyst from the catalyst cracking products;

VI. stripping said separated catalyst;

VII. regenerating said catalyst; and

VIII. recycling the regenerated catalyst to the reactor for contact with fresh feed.

4,347,123

REFORMING WITH MULTIMETALLIC CATALYSTS

Charles H. Mauldin, and William C. Baird, Jr., both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed May 5, 1980, Ser. No. 146,381
Int. Cl.[3] C10G *35/06*
U.S. Cl. 208—136 12 Claims

1. In a process for reforming an olefinic, nitrogen and sulfur containing hydrocarbon feed by contact thereof with a dried, calcined catalyst comprised of from about 0.1 to about 20 percent of a Group VI-B metal component composited with an inorganic oxide support, the improvement comprising

contacting and post-treating said dried, calcined catalyst composite with a solution of an alkali or alkaline-earth metal compound, incorporating from about 0.1 percent to about 4 percent of an alkali or alkaline-earth metal substantially entirely upon the surface of said catalyst composite sufficient to neutralize the Bronsted acidity of said catalyst composite, again

drying, and again

calcining said neutralized catalyst composite, and then

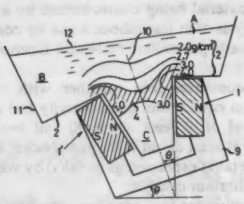
contacting said hydrocarbon feed with said dried, calcined, post-neutralized catalyst composite.

4,347,124

METHOD AND DEVICE OF SEPARATING MATERIALS OF DIFFERENT DENSITY BY FERROMAGNETIC LIQUID

Junzo Shimoiizaka, and Toyohisa Fujita, both of Sendai, Japan, assignors to Nittetsu Mining Co., Ltd., Japan

Filed Apr. 16, 1981, Ser. No. 254,765
Claims priority, application Japan, Jun. 24, 1980, 55-84573
Int. Cl.[3] B03B *5/36*
U.S. Cl. 209—1 3 Claims



1. An apparatus for separating nonferromagnetic solids according to specific gravity comprising:

a vessel having a bottom with upstream and downstream bottom portions which are inclined with respect to the horizontal;

at least one V-shaped groove defined in said vessel bottom between and below said upstream and downstream bottom portions, having side walls which sre symmetrical about a plane which is inclined with respect to the vertical;

a magnet with a pole face facing each side wall of said V-shaped groove for establishing a magnetic field thereacross and across said vessel; and

a ferromagnetic liquid filling said groove and vessel to a selected level above said upstream and downstream bottom portions and wherein equibuoyancy lines of force are established according to said magnetic field, so that with nonferromagnetic solids supplied to said vessel in the vicinity of said upstream bottom portion, solids of greater specific gravity move across said equibuoyancy lines and into said at least one groove and solids of less specific gravity move along said equibuoyancy lines and to the vicinity of said downstream bottom portion.

4,347,125

SORTING OF ORES WITH DETECTABLE COMPOUNDS

Peter M. Di Giacomo, Mission Viejo, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Filed Dec. 5, 1979, Ser. No. 100,618
Int. Cl.[3] B07C *5/02*
U.S. Cl. 209—3.3 20 Claims

1. A process for separating ore particles from gangue particles, comprising the steps of:

a. conditioning the particles with a conditioning agent comprising a compound having both a surface-selective functional group and a detectable moiety, to selectively coat either

i. at least a portion of the ore particles or

ii. at least a portion of the gangue particles to the substantial exclusion of the other;

b. detecting the coated particles; and

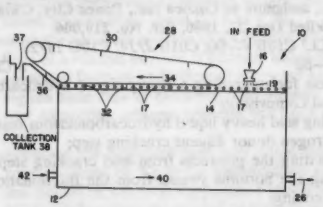
c. separating the detected, coated particles from the substantially uncoated particles.

4,347,126

APPARATUS AND METHOD FOR FLOTATION SEPARATION UTILIZING A SPRAY NOZZLE

Phillip E. McGarry, Palmerton, and David E. Herman, Jim Thorpe, both of Pa., assignors to Gulf & Western Manufacturing Company, New York, N.Y.

Filed Jan. 29, 1981, Ser. No. 230,058
Int. Cl.[3] B03D *1/02, 1/14*
U.S. Cl. 209—164 25 Claims



1. Apparatus for froth flotation separation of the components of a slurry having particulate matter therein, said apparatus comprising:

a. a flotation tank;

b. at least one spray nozzle adapted to cause a diverging spray, said spary nozzle positioned above said flotation tank and further adapted to spray under pressure an input slurry containing said particulate matter so that said particulate matter is dispersed through an aeration zone of increasing cross sectional area into the surface of a liquid in said tank to create a froth phase on the surface in which a quantity of the particulate matter is floating; and

c. means for controlling the agitation created by said at least one spray nozzle to provide a zone of turbulence extending a limited distance beneath the surface of a liquid in said tank.

8. A method for froth flotation separation of the components of a slurry having particulate matter therein, said method comprising the steps of:

a. spraying under pressure an input slurry having particulate matter therein through at least one spray nozzle adapted to cause a diverging spray so that said particulate matter is dispersed through an aeration zone into a liquid surface to create a froth on the surface in which a quantity of the particulate matter is floating;

b. controlling the agitation created by said at least one spary nozzle to provide a zone of turbulence extending a limited distance beneath said liquid surface; and

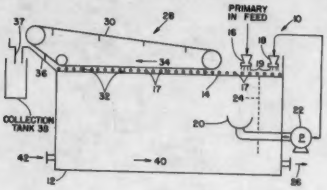
c. removing the froth from the liquid surface.

4,347,127

APPARATUS AND METHOD FOR FROTH FLOTATION SEPARATION OF THE COMPONENTS OF A SLURRY

James Duttera, Springfield; Raymond P. Jefferis, III, Gladwyne; David Matteson, Media, and Alexander Szentiaszloi, Westchester, all of Pa., assignors to Gulf & Western Manufacturing Company, New York, N.Y.

Filed Jan. 29, 1981, Ser. No. 230,059
Int. Cl.³ B03D 1/02, 1/14
U.S. Cl. 209—164 19 Claims



1. Apparatus for froth flotation separation of the components of a slurry having particulate matter therein which is to be separated, said apparatus comprising:

a. a flotation tank including means for withdrawing a floating fraction and means for withdrawing a tailings fraction;

b. means for feeding slurry comprising at least one primary spray nozzle adapted to cause a diverging spray, said spray nozzle positioned above said flotation tank and further adapted to spray under pressure input slurry of particulate matter so that said particulate matter is dispersed through an aeration zone of increasing cross sectional area into a liquid surface in the tank to create a froth on the surface;

c. a collector means positioned in said tank below said feed means for collecting sinking materials; and

d. at least one recycle spray nozzle positioned above said tank for spraying said collected sinking materials through an aeration zone into the liquid surface.

10. A method for froth flotation separation of the components of a slurry having particulate matter therein which is to be separated, said method comprising the steps of:

a. spraying under pressure an input slurry of particulate matter through a means for feeding slurry, said means for feeding slurry comprising a primary spray nozzle adapted to cause a diverging spray so that said particulate matter is dispersed through an aeration zone into a liquid surface to create a froth on the surface having a substantial quantity of particulate matter floating therein, while other components of the slurry and a minor quantity of particulate matter sink in the liquid, whereby the froth can be removed from the liquid surface;

b. collecting said sinking materials from the spray of the primary spray nozzle in a collector means positioned below said feed means;

c. utilizing a recycle spray nozzle to respray through an aeration zone into the liquid surface said collected sinking materials, whereby particulate matter therein is recycled and a portion of the recycled material floats as a froth on the liquid surface;

d. withdrawing said froth formed in steps a and c; and

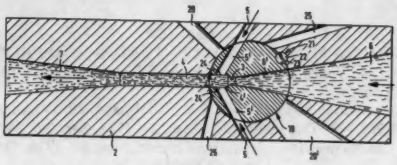
e. withdrawing a tailings fraction.

4,347,128

FLOTATION APPARATUS FOR DE-INKING PULP SUSPENSIONS

Wolfgang Barnscheidt, Dormagen-Straberg, Fed. Rep. of Germany, assignor to Feldmühle Aktiengesellschaft, Fed. Rep. of Germany and E. & M. Lamort S.A., France

Filed Apr. 8, 1981, Ser. No. 252,067
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1980, 3013655; Apr. 26, 1980, 3015788
Int. Cl.³ B03D 1/24
U.S. Cl. 209—170 8 Claims



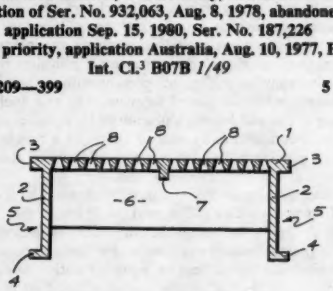
1. In flotation apparatus for de-inking of pulp suspension including a flotation cell and injectors for feeding said pulp suspension therethrough into said cell and for aerating said pulp suspension, the improvement comprising that said injectors are formed to define a wide slot nozzle having a generally rectangular configuration with a width dimension and a height dimension, said nozzle being dimensioned with a ratio of cross-sectional area to periphery of between 1.5 and 4 and that a generally rectangular mixing chamber receiving pulp suspension from said wide slot nozzle is provided adjacent said nozzle, said mixing chamber having a cross-sectional area which is between 1.3 to 1.7 times the cross-sectional area of said wide slot nozzle.

4,347,129

SCREENING MODULE

William Rutherford, Valentine, Australia, assignor to Hunter Wire Products Limited, Warners Bay, Australia

Continuation of Ser. No. 932,063, Aug. 8, 1978, abandoned. This application Sep. 15, 1980, Ser. No. 187,226
Claims priority, application Australia, Aug. 10, 1977, PD1183
Int. Cl.³ B07B 1/49
U.S. Cl. 209—399 5 Claims



1. A screening panel comprising a support frame having a plurality of framing bars aligned in parallel equi-spaced array across an area to be screened, and a plurality of elongated strips retained on said bars and each formed from a resilient plastics material; wherein each said framing bar has a substantially uniform rectangular cross-section and is positioned in said array with its wider sides vertical; each said strip has a planar surface member, a plurality of slots which extend through said surface member and are wider at the under side of said surface member than at the upper side thereof, two side walls which depend downwardly from said surface member, one adjacent each of two opposite edges thereof, and a plurality of reinforcing webs formed between the inner faces of said side walls and said under side of said surface member; and wherein each side wall has an outwardly facing channel

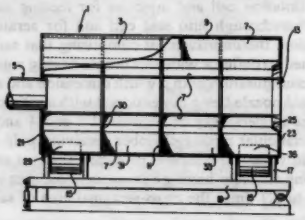
formed therein, the width of each said channel corresponding to the width of said wider side of said framing bars and the depth of each said channel corresponding to approximately one half of the width of the narrower sides of said framing bars whereby each said strip can be engaged between two adjacent ones of said framing bars without the use of tools by deforming of the resilient plastics material of the strip and pushing the strip into place so that each a wide side, corners and half the narrow side of the adjacent framing bar so that said framing bars are substantially fully enclosed by said strips when said assembly is complete.

4,347,130

PLACER MINERAL CONCENTRATOR AND PROCESS

Earl G. Younge, 20369 - 49A Ave., Langley, B.C., V3A 7H3, Canada

Continuation-in-part of Ser. No. 50,310, Jun. 20, 1979, Pat. No. 4,265,743. This application Mar. 25, 1981, Ser. No. 247,322
Claims priority, application Canada, Nov. 23, 1978, 316785
Int. Cl.³ B03B *5/56*
U.S. Cl. 209—452 **7 Claims**



1. Apparatus for extracting heavy metal from a precious metal-bearing ore comprising:

a rotatably mounted cylindrical drum having a substantially horizontally disposed axis, said drum having an input end, an output end, and an internal peripheral surface, said input end being substantially closed about input pipe means adapted for flowing a slurry of precious metal ore into said drum at a predetermined rate, the internal peripheral surface of said drum having a plurality of continuously annular riffles of predetermined height evenly spaced from the closed input end to and including the output end and having a plurality of longitudinally extending circumferentially spaced riffles of a height less than said annular riffles, means for selectively rotating said drum at a predetermined speed,

the size, spacing and respective heights of the longitudinal riffles and annular riffles, and the speed of the rotation of the drum are each such that the slurry is caused to vortex in a helical fashion over the said riffles and build a stream bed-like matrix of heavier particles within compartments formed by the riffles, the speed of rotation of the drum such that the matrix is maintained within the compartment by centrifugal force with the vortex action causing heavier particles to settle and form part of the matrix within the compartments, while the lighter particles are kept in suspension by the vortex action and are carried out of the apparatus through the output end,

means for selectively and periodically tilting said drum and flushing out said matrix with liquid.

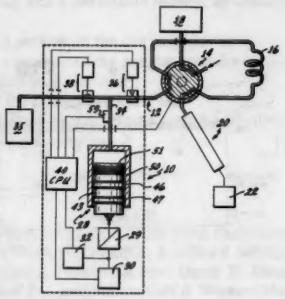
4,347,131

LIQUID CHROMATOGRAPHIC PUMP MODULE

Robert Brownlee, 26050 Kriste La., Los Altos Hills, Calif. 94022

Filed Apr. 28, 1981, Ser. No. 258,404
Int. Cl.³ B01D *15/08*
U.S. Cl. 210—101 **8 Claims**

1. In LC apparatus, a separation column having a stationary phase through which a pump drives a mobile phase containing a sample having components to be separated by differential adsorption as the sample is passed through the stationary phase, a sample injection valve, a one shot delivery system comprising a pump, means for refilling the pump including a reservoir of said mobile phase, a first positive actuated valve for connecting the pump output to said sample injection valve during a delivery stroke, a second positive activated valve for connecting said pump to said reservoir of said mobile phase during the uptake stroke, means for driving the pump to de-



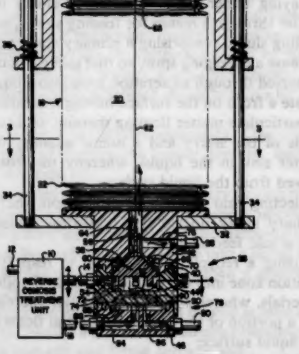
liver therefrom precise quantities of the said mobile phase to the sample injection valve, fast return motor means, means for connecting the pump to said fast return means during the uptake stroke, means for synchronizing and controlling the foregoing elements such that said first valve is opened and said second valve is closed during the uptake stroke as operated by said fast return motor means while said first valve is closed and said second valve is opened when the pump is connected to said first motor means for said delivery stroke.

4,347,132

REVERSE OSMOSIS EXPANSIBLE PRESSURIZED PERMEATE STORAGE HAVING PERMEATE AND CONCENTRATE CONTROLS

Stephen H. Davis, Dayton, Ohio, assignor to Water Refining Company, Inc., Middletown, Ohio

Filed Feb. 17, 1981, Ser. No. 235,221
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—104 **32 Claims**



1. An arrangement for storing treated water received from a

reverse osmosis treatment unit of the type having a treated water output line and a bleed water output line separated by a reverse osmosis semipermeable membrane, and for maintaining the stored treated water under pressure, comprising:

expandable container means having a movable portion and defining an expandable storage chamber for storing treated water,

container valve means, connecting said storage chamber to said treated water output line of said reverse osmosis treatment unit, for permitting flow of treated water to said storage chamber when less than a predetermined quantity of treated water is stored in said storage chamber, and for terminating said flow of treated water to said storage chamber when said predetermined quantity of treated water is stored in said storage chamber, said container valve means including mechanical linkage means connected to said movable portion of said container means for providing solely mechanical control of said container valve means, and

pressure spring means for applying a spring force to said expandable container means to maintain said stored treated water in said storage chamber under pressure.

4,347,133

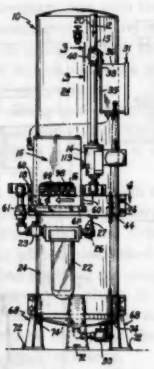
ELECTROMAGNETIC GROUND WATER CONDITIONING SYSTEM AND SAMPLING DEVICE FOR WASTE WATER AND FERMENTATION MAKEUP WATER

Miguel F. Brigante, 16550 NW. 10th Ave., Miami, Fla. 33169

Continuation-in-part of Ser. No. 153,219, May 27, 1980, Pat. No. 4,288,323. This application Jun. 5, 1981, Ser. No. 270,741

Int. Cl.³ C02F *1/48*

U.S. Cl. 210—138 **10 Claims**



1. An electromagnetic ground water conditioning apparatus comprising:

a holding tank with an inlet and an outlet for holding ground water which is treated in said apparatus;

an electromagnetic water conditioning unit comprising an inlet from said tank, a ferromagnetic casing, an electromagnetic winding surrounding said casing to create a magnetic field of about 3,000 oersteds on said casing, an impeller mounting in bearings at each end of said casing which rotates in response to the water pressure from said inlet and a water outlet at the other end of said casing;

a pump between said holding tank outlet and said electromagnetic unit;

a semicircular band fitted with flanges which encircles said holding tank and is adapted to hold a bracket supporting means to mount said electromagnetic unit at about the middle of said holding tank;

a bracket connected to said band to mount said electromagnetic water conditioning unit;

a pipe means connecting said pump to the inlet pipe of said electromagnetic unit;

a filter means between said pump and inlet pipe fed by water passing through said pipe means;

said pipe means further connecting said filter means to the outlet of said electromagnetic unit;

a return line from the outlet of said filter to said holding tank for recirculating water from said filter back into said holding tank by the pumping action of said pump into said electromagnetic water conditioning unit; and

a blowdown unit comprising timing devices electrically connected to a solenoid operated drain valve at the bottom of said tank whereby solids precipitated by the electromagnetic treatment in said electromagnetic unit are blown out of said tank for predetermined short intervals of the order of seconds to thereby clarify the incoming water without the need for water treatment chemicals.

4,347,134

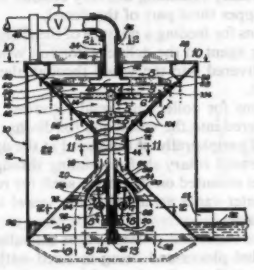
SLURRY SEPARATOR HAVING REACTION NOZZLE DRIVEN ROTORY BLADES WIPING A CONICAL FILTER

Oswald C. Svehaug, 114 SW. 5th, Milton-Freewater, Oreg. 97862

Filed Sep. 3, 1981, Ser. No. 298,858

Int. Cl.³ C02C *1/22*; B01D *29/26*

U.S. Cl. 210—147 **4 Claims**



1. A separator for separating a mixture of liquids and solids delivered under pressure to the separator as a slurry, said separator comprising:

(a) a stationary frame defining an upwardly open perforated conical grid, which is generally symmetrical about a vertical central axis;

(b) a rotor structure on a vertical axis freely rotatably mounted coaxially with said central axis inside said stationary frame;

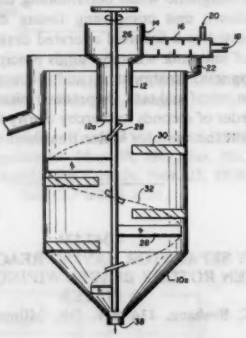
(c) said rotor structure including a nozzle angularly directed with respect to a radial direction from said vertical axis spaced from and directed toward said grid, said nozzle having means to supply same with pressurized slurry and directed such that slurry forced through said nozzle causes said rotary structure to rotate; and

(d) a plurality of wiper blades, some of which are circumferentially staggered and axially overlapping with respect to others supported on said rotary structure and held against the surface of said grid such that as said frame rotates said wiper squeegees across said grid to press liquid through said grid, with said blades being angled such that axially upstream blades squeegee slurry downward and into the paths of more downstream blades to cause a continuous progressive squeegee action in the downward direction.

4,347,135
APPARATUS FOR SUPERFLOCCULATING AND THICKENING A SLUDGE

Jean R. M. Lafosse, and Bernard J. Robert, both of Avon, France, assignors to Fives-Cail Babcock, Paris, France

Filed Aug. 18, 1978, Ser. No. 934,995
Claims priority, application France, Aug. 23, 1977, 77 25647
Int. Cl.[3] C02F *1/52*
U.S. Cl. 210—208 8 Claims



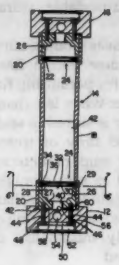
1. An apparatus for superflocculating and thickening a sludge, which comprises
(a) a cylindrical vessel having an upper part and a lower part,
(b) an axially extending delivery conduit having an outlet in the upper third part of the vessel,
(c) means for feeding a mixture of the sludge and of a flocculating agent to the delivery conduit whereby the mixture is delivered into the vessel through the delivery conduit outlet,
(d) means for collecting liquid removed from the mixture delivered into the vessel and for discharging the removed liquid peripherally of the vessel at the upper part thereof,
(e) a vertical rotary shaft extending through the vessel,
(f) vanes mounted on the rotary shaft for rotation therewith,
(g) counter-vanes arranged in the vessel to cooperate with the vanes,
(1) the vanes and counter-vanes extending in substantially radial planes and being inclined with respect to each other, the inclinations of cooperating vanes and counter-vanes being in opposite directions, the vanes forming a discontinuous helix extending from the upper to the lower part of the vessel and the pitch of the helix diminishing towards the lower part of the vessel, and
(h) a discharge conduit for the thickened sludge in the lower part of the vessel.

4,347,136
BACTERIA STATIC FILTER ASSEMBLY

Neil Friesen, 11 Cornwallis Dr., Northwest Calgary, Alberta, Canada (T2K 1T5), and Urs Steiner, 2138 - 28th Ave., Southwest Calgary, Alberta, Canada (T2T 1K5)

Filed Feb. 18, 1981, Ser. No. 235,607
Int. Cl.[3] B01D *27/02*
U.S. Cl. 210—253 7 Claims

1. A filter assembly comprising two elongated filter tubes, each filter tube having end portions defining remotely facing shoulders in its interior, a screen unit seated on each of said shoulders, an end plug seated in each of said end portions and holding each screen unit seated against its respective shoulder, each of said end plugs having a through passage for a passing liquid, and a filter medium in the filter tube between said screen units, said two filter units being disposed in parallel relation, end plates at opposite ends of said filter units secured to said filter units and forming in combination therewith an integral filter assembly, each of said end plates having flow passages therein in sealed communication with said through passages in said end plugs said flow passages being arranged with said through passages to supply liquid to and remove liquid from

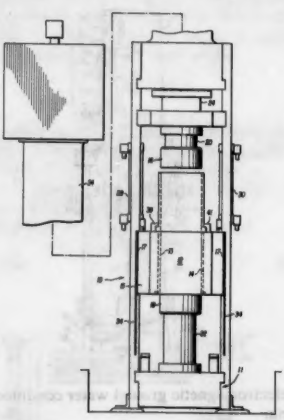


said filter medium, each end plug having an outer end opposing a respective end plate, and a sealing ring carried by each end plug surrounding its through passage with each sealing ring compressively engaging a respective end plate.

4,347,137
APPARATUS FOR CONSOLIDATION OF SLURRIES OF SOLID PARTICULATE MATERIALS

Perry J. Dick, Jr., Pittsburgh, Pa., assignor to Norwood Minerals, Inc., Pittsburgh, Pa.

Filed Jun. 17, 1981, Ser. No. 274,541
Int. Cl.[3] B01D *33/00*
U.S. Cl. 210—329 12 Claims



1. An apparatus for removing liquid from a slurry of solid particulate material and for consolidating said solid material into a shape-retaining slug, comprising
(a) a cylindrical consolidation chamber in which the slurry is to be consolidated, which is substantially sealed against the passage of solid material, said chamber comprising
(i) a first cylindrical piston mounted in a stationary position with its axis aligned vertically, the upper surface of said piston being its working face,
(ii) a mold comprising a cylindrical wall defining a cylindrical bore in which said first piston is movable axially and which is disposed with its axis aligned vertically and a horizontal table having a circular opening through one end thereof, said table being mounted to the upper edge of said wall so that said opening communicates with said bore in said wall and the surface of the

table extends outward from said wall in a direction perpendicular to the axis thereof, said mold having a compression position in which the face of said first piston is within the lower edge of said bore and a charging position in which the face of said first piston is at about the same level as the upper surface of said table, and

(iii) a second cylindrical piston having its axis aligned vertically and movable axially within said cylindrical bore, the lower surface of said piston being its working face,

(b) a drainage means for allowing liquid to escape from said chamber during consolidation of said slurry,

(c) a porous structure for retaining solid particulate material within said chamber and for allowing liquid to escape from said chamber during consolidation, said porous structure being disposed between said drainage means and said slurry within said chamber,

(d) a first pressure means for reciprocating said mold between its compression position and its charging position and for maintaining said mold in each of said positions,

(e) a compression means for reciprocating said second piston axially within said bore and for applying compressive stress to said slurry within said chamber to cause consolidation thereof,

(f) a charging box comprising at least one vertically aligned wall and two horizontally aligned open ends which define a volume, said box being slidable horizontally on said table between a filling position in which said box is disposed on said table so that the lower end of said box is closed to the flow of slurry therethrough and a charging position in which said box is disposed on said table so that the lower end thereof communicates with the bore of said mold,

(g) a second pressure means for reciprocating said charging box between its filling position and its charging position by sliding said box on said table and for maintaining said box in each of said positions,

(h) a means for filling said charging box with a predetermined amount of slurry, said filling means being disposed over said charging box when it is in its filling position, wherein

(1) when said mold is filled with slurry and is in its compression position and said charging box is in its filling position, said compression means is actuated thereby moving said second piston downward into said bore of said mold and applying compressive stress to the slurry through said second piston to consolidate said slurry into a slug of solid material and said filling means is actuated thereby filling said charging box with a predetermined amount of slurry,

(2) said compression means is then actuated thereby moving said second piston upward out of said chamber and said first pressure means is actuated thereby moving said mold from its compression position to its charging position and stripping the mold from the slug of solid material,

(3) said second pressure means is then actuated thereby sliding said filled charging box on said table from its filling position to its charging position, thereby pushing said slug of solid material off of the upper surface of said first piston and said table,

(4) said first pressure means is then actuated thereby moving said mold from its charging position to its compression position and filling the mold with the slurry in the charging box, and

(5) said second pressure means is then actuated thereby sliding said empty charging box on said table from its charging position to its filling position.

4,347,138

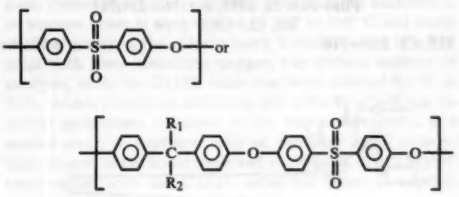
METHOD OF SEPARATING SERUM ALBUMIN AND GAMMA-GLOBULIN FROM EACH OTHER

Shotaro Ohno; Kenji Koyama, both of Tokuyama, and Mitsutoshi Fukuda, Shin Nanyo, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Dec. 3, 1980, Ser. No. 212,746
Claims priority, application Japan, Dec. 10, 1979, 54-159131
Int. Cl.³ B01D *13/00*
U.S. Cl. 210—639 **3 Claims**

1. A method of separating serum albumin and a serum γ-globulin from each other in a solution of a mixture thereof using a semipermeable membrane, said method comprising forcing the blood serum protein mixture solution through an ultrafiltration membrane

having a cut off molecular weight of about 100,000 and composed of an aromatic polyether sulfone having recurring units represented by the following formula:



wherein R_1 and R_2 each stand for a hydrogen atom or an alkyl group having 1 to 2 carbon atoms,

while adjusting the total protein concentration and salt concentration in the mixture solution to not more than 4 g/dl and not more than 0.6 mole/l, respectively, and also adjusting the pH of the solution to a value of from about 3.8 to about 4.7.

4,347,139

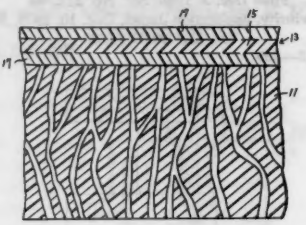
MEMBRANE FOR REVERSE OSMOSIS AND METHOD OF MAKING THE SAME

Yoshihiro Hayashi, Kyoto, Japan, assignor to Juichiro Ozawa, Japan

Filed Mar. 24, 1980, Ser. No. 132,848
Int. Cl.³ B01D *13/00*
U.S. Cl. 210—654 **7 Claims**

1. A method of making a membrane for reverse osmosis which is capable of passing non-ionic substance and blocking the passage of ionic substances and which comprising a porous base and a thin high polymer film attached to said porous base, said thin high polymer film including at least one layer of radical polymer of nitrogen containing monomer and alkyl metal and at least one layer of polymer of nitrogen containing monomer which are alternately laminated together, said method comprising the steps of: placing at least one porous base in a plasma created by glow discharge; and introducing alternately a first polymerization reaction feed including nitrogen containing monomer, alkyl metal and an inert carrier gas and a second polymerization reaction feed including nitrogen

containing monomer, an inert carrier gas and no alkyl metal into said plasma to alternately cause on said porous base a radical polymerization reaction between nitrogen containing monomer and alkyl metal and a polymerization reaction of nitrogen containing monomer.



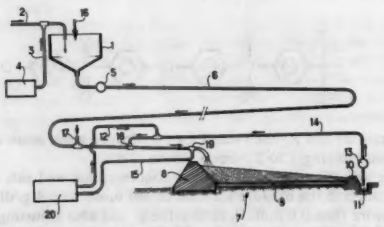
7. A method of using a membrane according to claim 1, for reverse osmosis comprising supplying an aqueous solution of ionic and non-ionic substance to one side of said membrane to separate the ionic substances from the non-ionic substances, the non-ionic substances passing through said membrane and the ionic substances being blocked from passage to said membrane.

4,347,140

INSTALLATION FOR AND A METHOD OF SPREADING CLAYEY MUD AND RECLAIMING LAND

Elie Condolios, and Pierre Couratin, both of Grenoble, France, assignors to Alsthom-Atlantique, Paris, France

Filed Jan. 13, 1981, Ser. No. 224,761
Int. Cl.³ C02F *1/54*
U.S. Cl. 210—710 **4 Claims**



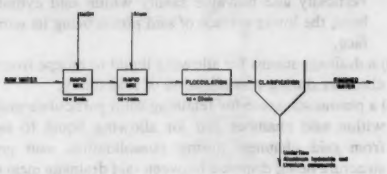
1. An installation for spreading clayey mud on ground defining a spreading area which is free from water and which is prepared to receive the mud by laying a filtering bottom above the level of ground water, said installation comprising a decanting tank, means for supplying to said tank a mixture of mud and flocculating agent for settling, a pipe leading from said decanting tank, a mud extraction pump within said pipe for extracting said settled mixture of mud and flocculating agent from the decanting tank and to convey said mixture up to at least one high mud pouring point located above said prepared ground, said installation further comprising means connected to said pipe just upstream of said at least one high mud pouring point for adding extra flocculating agent to said mixture to effect superflocculation of the extracted mud just prior to spreading over the spreading area, said spreading area lying between at least one upstream embankment and one downstream embankment, the upsteam embankment constituting said high pouring point and said spreading area further being slightly inclined downwardly and away from said upper embankment in a direction towards said downstream embankment.

4,347,141

PROCESS FOR REMOVAL OF RADIOACTIVE MATERIALS FROM AQUEOUS SOLUTIONS

Michael R. Rothberg, 8268 S. Locust St., Englewood, Colo. 80112

Filed Jul. 14, 1980, Ser. No. 168,009
Int. Cl.³ C02F *1/52*
U.S. Cl. 210—721 **7 Claims**



1. A process for decontaminating a water solution having contained therein naturally occurring radioactive materials, said solution containing dissolved uranium and having both alpha particle and beta particle activity and a pH of about 7.0–8.6, comprising the steps of:

adjusting the pH of the solution to greater than 9.0 and less than 10.0 while simultaneously rapidly mixing said solution;

adding approximately eighty to one hundred milligrams per liter of alum while simultaneously rapidly mixing said solution for a period of at least 1 minute, thereby lowering the pH of the solution to between 5.5 and 7.0;

slowing mixing said solution for a period of about twenty minutes to thereby form a precipitate containing aluminum hydroxide and said dissolved uranium in said solution; and

separating said precipitate from the solution.

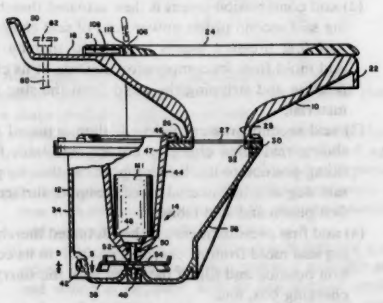
5. The process as defined in claim 1 further including the step of incorporating simultaneously with the addition of alum approximately 6.0 milligrams per liter of hydrogen peroxide.

4,347,142

EFFLUENT TREATMENT IN A NON-POLLUTING TOILET SYSTEM

James H. Albertassi, West Falmouth, Mass.; Walter O. Heinze, Swarthmore, Pa., and Aaron Landsman, Buzzards Bay, Mass., assignors to International Water Saving Systems, Inc., New York, N.Y.

Continuation of Ser. No. 37,655, May 11, 1979, abandoned, and a continuation-in-part of Ser. No. 939,992, Sep. 6, 1978, abandoned. This application Dec. 22, 1980, Ser. No. 219,242
Int. Cl.³ C02F *1/76*
U.S. Cl. 210—756 **1 Claim**



1. The method of treating human waste effluent solid matter in a toilet system wherein there is a bowl for receiving a de-

posit of effluent, a pump for delivering flush water to the bowl to effect flushing and a treating tank containing a hydraulic attrition device for receiving effluent and flush water from the bowl, the method comprising, with the aid of the pump, delivering 1½ liters of flush water to the bowl to flush the effluent from the bowl into the treating tank and, with the aid of the hydraulic attrition device in the form of a rotating blade having a blade diameter of 3 to 7 inches, rotated at 5000 rpm for 2½ minutes, reducing the solids in the effluent by hydraulic attrition in contrast to maceration to a particle size which ranges from ½ inch to ¼ microns and in which the solid matter in excess of 1/64 of an inch does not exceed more than 18% of the total solid matter, adding a decontaminant to the treating tank during hydraulic attrition to effect decontamination in the form of a 20 gram tablet containing 60% to 95% by weight of calcium hypochlorite and passing said effluent through an upflow filter containing a bed of buoyant particulate material, to separate the solids from the effluent.

4,347,143

APPARATUS AND PROCESS FOR PURIFYING POLLUTED WATER CONTAINED IN NATURAL OR ARTIFICIAL POOLS BY DIRECT INJECTION OF OXYGEN

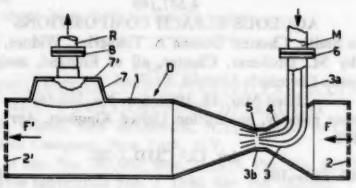
Gianmaria Righetti, Via Losanna 29, Milano, Italy

Filed Nov. 8, 1976, Ser. No. 740,068

Claims priority, application Italy, Nov. 11, 1975, 29164 A/75; Sep. 10, 1976, 27088 A/76

Int. Cl.³ C02F 1/72

U.S. Cl. 210—758 **11 Claims**



1. An apparatus for oxygenating polluted water contained in natural or artificial bodies of water exposed at the surface thereof to the atmosphere, comprising:

(a) pipe means, placeable at the bottom of the body of water, for permitting passage therethrough of water in the body of water, said pipe means comprising a horizontally disposed, longitudinally extended, axially open, substantially tubular pipe having a Venturi-shaped throat therein;

(b) injection means for injecting pressurized oxygen into said pipe means in a manner such that the water is caused to flow through said pipe means, said injecting means including a nozzle, the injection throat of which being directed axially, in a downstream direction, at the throttling zone of the Venturi-shaped throat of said pipe; and

(c) an oxygen collection means for collecting undissolved oxygen before it is expelled from said pipe means, comprising an oxygen collecting chamber fixedly secured to said pipe means at a distance downstream of the point of oxygen introduction by said injection means.

11. A method of oxygenating polluted water contained in natural or artificial bodies of water exposed at the surface thereof to the atmosphere, using the apparatus of claim 1, comprising:

submerging said pipe means to the bottom of the body of water;

injecting oxygen by means of said injection means; and

collecting undissolved oxygen before it is expelled from said pipe means, by means of said oxygen collection means.

4,347,144

PROCESS FOR THE PURIFICATION OF EFFLUENT

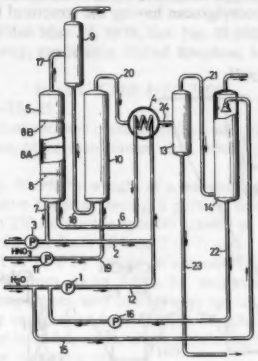
Kurt Bodenbenner, Wiesbaden; Helmut Perkow, Hofheim am Taunus, and Helmut Vollmüller, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 6, 1981, Ser. No. 318,860

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1980, 3042193

Int. Cl.³ C02F 1/72

U.S. Cl. 210—761 **5 Claims**



1. A process for the purification of effluent containing organic impurities which are difficult to degrade, by oxidation in an aqueous phase at temperatures of 100° to 310° C. and under elevated pressure, the effluent being initially treated in a first stage with gases containing oxygen, but without addition of catalysts, until the C.O.D. value has been reduced by 50 to 98%, which comprises subjecting the effluent which has received preliminary treatment in this way, subsequently, in a second stage, to treatment with an oxidizing agent stronger than oxygen, in the liquid phase and at the same, or at a higher, temperature, until the C.O.D. value has fallen to approximately 0 g/l.

4,347,145

FOAM COMPOSITION FOR TREATING TEXTILE MATERIALS AND METHOD OF PREPARATION

Razmic S. Gregorian, Aiken, and Chettoor G. Namboodri, North Augusta, both of S.C., assignors to United Merchants & Manufacturers, Inc., New York, N.Y.

Continuation of Ser. No. 943,830, Sep. 19, 1978, abandoned, which is a continuation-in-part of Ser. No. 794,627, May 6, 1977, abandoned, and Ser. No. 584,389, Jun. 6, 1975, Pat. No. 4,118,526. This application Jul. 2, 1980, Ser. No. 165,266

The portion of the term of this patent subsequent to May 12, 1998, has been disclaimed.

Int. Cl.³ D08M 13/00; B01J 13/00; C09B 67/02; C09K 3/18

U.S. Cl. 252—8.6 **18 Claims**

1. A foamable composition which is capable of being formed into a foam suitable for treating fabrics with a finishing agent, said foam being sufficiently stable to substantially retain its characteristics during application and not collapse between the time when the initial foaming takes place and the time when the foam is introduced into the fabric, said composition comprising a predetermined amount of fabric finishing agent sufficient to impart the desired finish to the fabric and an effective amount up to about 10 percent of foaming agent sufficient to form said composition into a stable foam having a blow ratio in the range from about 2:1 to 20:1, and a foam density in the range from about 0.5 gm/cc to 0.05 gm/cc, and wherein the ratio of active solids to that of total foamer is at least 8:1.

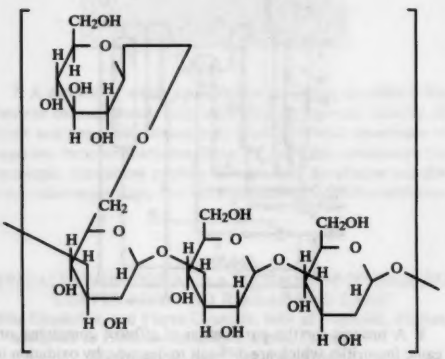
4,347,146

OIL RECOVERY PROCESS EMPLOYING A NON-IONIC GLUCAN IN COMBINATION WITH CLAY FLOCCULANT

Milton K. Abdo, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 29, 1981, Ser. No. 229,372
Int. Cl.³ E21B *43/22*
U.S. Cl. 252—8.55 D 3 Claims

1. In an improved process for producing petroleum from a petroleum-bearing subterranean formation wherein an aqueous driving fluid containing a poly(glycosylglucan) thickening agent, the glycosylglucan having the structural formula:



is injected into said formation through an input well and passed through the formation to an output well, the improvement comprising employing in combination with said poly(glycosylglucan) between about 5 ppm and about 50 ppm or unhydrolyzed polyacrylamide having a weight average molecular weight between about one million and about 7 million, whereby adsorption of said poly(glycosylglucan) by clays is minimized.

4,347,147

PROCESS FOR PREPARING OVERBASED MAGNESIUM SULFONATES

Ronald J. Allain, Naperville, Ill., and Dodd W. Fong, Richmond, Tex., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 184,156, Sep. 4, 1980, Pat. No. 4,306,983, and a continuation-in-part of Ser. No. 24,230, Mar. 26, 1979, abandoned. This application Dec. 5, 1980, Ser. No. 213,323
The portion of the term of this patent subsequent to Dec. 22, 1998, has been disclaimed.
Int. Cl.³ C10M *1/40*
U.S. Cl. 252—33.3 5 Claims

1. In the method of preparing overbased magnesium sulfonates by sulfonating an alkyl benzene with a material containing SO_3 which material is selected from one member of the group consisting of SO_3 and oleum and reacting the alkyl sulfonate product with magnesium oxide in the presence of a low viscosity diluent, water, alcohol, and CO_2, the improvement which comprises positively utilizing oleum in the sulfonation step and additionally adding to the original overbased magnesium sulfonate sufficient magnesium oxide and a surfactant couple comprising a C_{12}–C_{18} fatty acid and an alkanol amide which produces a superbased magnesium sulfonate with a magnesium content of about 14–23% and a zone particle size of about 40% 200 A and about 60% 0.1–1.0 microns.

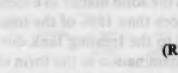
4,347,148

FULL AND LUBRICANT COMPOSITIONS CONTAINING NITRO PHENOLS

Kirk E. Davis, Euclid, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 705,653, Jul. 15, 1976, abandoned. This application Nov. 19, 1979, Ser. No. 95,290
Int. Cl.³ C10M *1/32, 3/26, 5/20, 7/30*
U.S. Cl. 252—51.5 R 75 Claims

1. A nitro phenol of the formula



wherein R is an aliphatic substituent of at least about 40 carbon atoms; R is para to at least one -OH substituent attached directly to Ar; b and c are each independently integers of 1 up to three times the number of aromatic nuclei in Ar with the sum b+c not exceeding the number of unsatisfied valences in Ar, a is one and Ar is a benzene moiety having 0 to 3 optional substituents selected from the group consisting of lower alkyl, lower alkoxyl, halo, carboxy, carboxy ester of mono- and dihydric C_{1-7} alkanols and carboxamide wherein the amide nitrogen can have up to 1 or 2 C_{1-7} alkyl substituents and combinations of said optional substituents.

59. A fuel or lubricant composition comprising a major proportion of a normally liquid fuel or a lubricating oil of lubricating viscosity and a minor proportion of the nitro phenol claimed in claim 1.

4,347,149

AQUEOUS BLEACH COMPOSITIONS

Eileen Smith, Chester; Doreen A. Timperley, Widnes, and Dorothy M. Titchener, Chester, all of England, assignors to Interox Chemicals Limited, England

Filed Mar. 18, 1981, Ser. No. 245,140
Claims priority, application United Kingdom, Apr. 1, 1980, 8010886
Int. Cl.³ C11D *7/54*
U.S. Cl. 252—102 18 Claims

1. A liquid bleach composition comprising:
3% to 20% by weight hydrogen peroxide;
at least one base in an amount sufficient to render the composition alkaline;
5% to 20% by weight ethanol;
a stabilising amount of a substituted amino compound having the formula $R—NR—(CH_2)_p]_q—NR_2$ in which p is from 2 to 6, q is from 0 to 2, and R represents an acetate or methylene phosphate group;
and water.

4,347,150

PENETRATING COMPOSITIONS FOR WET REMOVAL OF FRIABLE INSULATION MATERIALS

John Arpin, 1716 Melville St., Ocean, N.J. 07712

Filed Jun. 16, 1981, Ser. No. 274,172
Int. Cl.³ B08B *7/00*
U.S. Cl. 252—135 11 Claims

1. A stripping composition useful for removing a friable material comprising a blend of
PART I an aqueous silicate solution component comprising:
(a) 5 to 30 weight percent of an aqueous alkali metal silicate selected from potassium silicate or a mixture of potassium silicate and sodium silicate;
(b) 0.01 to 10 weight percent of a cationic or nonionic surfactant;
(c) 70 to 95 weight percent water; and
PART II an acrylic polymer dispersion component comprising:
(a) 45 to 65 weight percent of an acrylic polymer latex having a solids content of 40 to 65 weight percent, said

acrylic polymer selected from the group consisting of homopolymers and copolymers of lower alkyl esters of acrylic acid or lower alkyl esters of an alpha-lower alkyl acid or mixtures thereof;

(b) 0.01 to 10 weight percent of a reagent that reacts with said alkali silicate;

(c) 35 to 55 weight percent water;

wherein the ratio of PART I to PART II provides a blended composition having a solids content between 5 and 30 weight percent.

4,347,151

CLEANER-POLISH FOR FIBERGLASS AND CERAMIC SURFACES

Robert H. Lohr, Union Grove, and Lee W. Morgan, Racine, both of Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Jun. 30, 1981, Ser. No. 279,126

Int. Cl.³ C11D *17/00*

U.S. Cl. 252—163 **7 Claims**

1. A cleaner-polish for kitchen and bathroom surfaces, comprising:

(a) From about 0.3 to 8% of an anionic and nonionic surfactant which will produce an oil in water emulsion;

(b) From about 0 to 18% by weight of an abrasive;

(c) From about 5 to about 40% by weight of an isoparaffinic hydrocarbon having a kauri-butanol value of from about 27 to 29;

(d) From about 1 to 8% by weight of a polymer having M_n of greater than 3,000 and soluble in said hydrocarbon, said polymer comprising at least 80% of isobornyl acrylate, isobornyl methacrylate, cyclohexyl acrylate, cyclohexyl methacrylate, vinyl toluene, t-butyl styrene and mixtures thereof;

(e) And about 30 to 90% by weight water.

4,347,152

PHOSPHATE-FREE CONCENTRATED PARTICULATE HEAVY DUTY LAUNDRY DETERGENT

Harold E. Wixon, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 747,002, Dec. 2, 1976, Pat. No. 4,260,651. This application Sep. 2, 1980, Ser. No. 183,021

Int. Cl.³ C02B *1/44*; C11D *3/10, 3/12, 11/00*

U.S. Cl. 252—174 **10 Claims**

1. A free flowing, phosphate free, particulate, heavy duty laundry detergent of bulk density of at least 0.6 g/cc and particle sizes in the range of 4 to 40 mesh which comprises nucleus particles of alkali metal carbonate and alkali metal bicarbonate, in a ratio of 1:10 to 10:1 by weight, initially of particle sizes in the 20 to 100 mesh range, containing and coated with a first coating of a normally liquid or pasty nonionic detergent, which nonionic detergent coating is coated with a first coating of detergent building zeolite particles, said zeolite particles comprising ion exchanging aluminosilicate zeolite selected from the group consisting of crystalline, amorphous and mixed crystalline and amorphous zeolites, said zeolites having an ultimate particle diameter in the range of from about 0.005 to about 20 microns, and wherein the percentages of alkali metal carbonate and alkali metal bicarbonate, zeolite and nonionic detergent in said first nonionic detergent and zeolite coated particle are in the ranges of about 20 to 40%, 40 to 60% and 10 to 30% respectively, and on said first nonionic detergent and zeolite coating a second coating of nonionic detergent, and on said second coating of nonionic detergent a second coating of said detergent building zeolite, wherein the amount of nonionic detergent coated onto said first formed particle is about 1:2 to 1:1 of the amount of nonionic detergent in said first formed particle, and wherein the amount of zeolite applied to said second nonionic detergent coating is about 1:2 to 1:1 of the amount of zeolite in said first formed particle and wherein said detergent building zeolite has ultimate particle diameters in the range of from about 0.005 to 20 microns, and wherein the hardness ion exchange rate and capacity of said zeolite is such that when about 375 ppm of said zeolite on an anhydrous basis is placed in water at about 45° C. containing about 40 ppm of undissolved calcium ion while vigorously stirring, the dissolved calcium ion content of the water is reduced to at least about 8 ppm in at least 5 minutes.

4,347,153

DEODORANT ABRASIVE CLEANER FOR SURFACE TREATMENT

David C. Hooper, Ashford; George A. Johnson, Gayton; Donald Peter, Thornton-Hough, and George K. Reanie, Bebington, all of England, assignors to Lever Brothers Company, New York, N.Y.

Filed May 14, 1979, Ser. No. 38,981

Claims priority, application United Kingdom, May 16, 1978, 19844/78

Int. Cl.³ C11D *3/14, 7/02*

U.S. Cl. 252—174.25 **15 Claims**

1. A deodorant abrasive cleaner product suitable for application to surfaces other than human skin, which product comprises:

(i) from 1 to 99.9% by weight of a water-insoluble particulate abrasive material having a particle size diameter of from 1 to 250 microns, a specific gravity of from 0.5 to 5 and a Mohs' hardness of from 2 to 7; and

(ii) from 0.1 to 20% by weight of a deodorant composition comprising from 45 to 100% by weight of deodorant active components, said components having a lipoxidase-inhibiting capacity of at least 50% or a Raoult variance ratio of at least 1.1, said components being classified into six classes consisting of:

Class 1: phenolic substances

Class 2: essential oils, extracts, resins and synthetic oils

Class 3: aldehydes and ketones

Class 4: polycyclic compounds

Class 5: esters

Class 6: alcohols

provided that where a component can be classified into more than one class, it is placed in the lower or lowest numbered class;

said components being so selected that

(a) the deodorant composition contains at least five components of which at least one must be selected from each of Class 1, Class 2 and Class 4;

(b) the deodorant composition contains components from at least 4 of the 6 classes; and

(c) any component present in the deodorant composition at a concentration of less than 0.5% by weight of said composition is eliminated from the requirements of (a) and (b);

the deodorant composition having a deodorant value of from 0.50 to 3.5 as measured by the Deodorant Value Test.

4,347,154

METHYLENE CHLORIDE STABILIZER FORMULATION FOR USE IN AEROSOLS

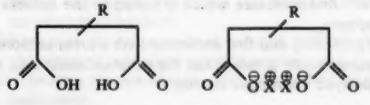
Robert W. Simmons, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 23, 1980, Ser. No. 199,787

Int. Cl.³ C09K *3/30*; C07C *17/42*; C23F *11/14*

U.S. Cl. 252—305 **2 Claims**

2. An aqueous aerosol composition containing a chlorinated hydrocarbon suitable for use in aerosol spray cans wherein said composition contains an inhibitor against metal corrosion which is selected from the group of substituted succinic acid and substituted imidazoline derivatives having the formulas



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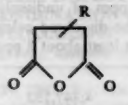
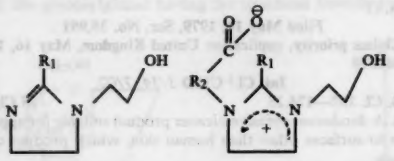


wherein X is sodium, potassium, ammonium or an amino group and R is an alkyl or alkenyl radical having from 3 to 16 carbon atoms, and



wherein R_1 is an aliphatic hydrocarbon radical having from one to twelve carbons and R_2 is a divalent hydrocarbon chain having from two to six carbon atoms, and wherein X, having the above meaning, may be substituted on the carboxyl radical of the imidazoline derivative.

4,347,155

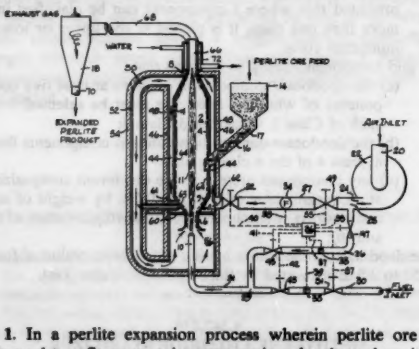
ENERGY EFFICIENT PERLITE EXPANSION PROCESS

Kenneth L. Jenkins, Littleton, Colo., assignor to Manville Service Corporation, Denver, Colo.

Continuation of Ser. No. 754,385, Dec. 27, 1976, abandoned. This application Mar. 19, 1981, Ser. No. 245,421

Int. Cl.³ C04B *31/26, 31/22;* **F27B** *15/00*

U.S. Cl. 252—378 P **8 Claims**



1. In a perlite expansion process wherein perlite ore is charged to a flame zone in an expansion chamber where it is rapidly heated and expands, and is thereafter transported out of the flame zone by entrainment in the exhaust gas stream of the flame zone, and wherein said expansion chamber has an inlet port at one end and an outlet port at the other end and burner means for creating said flame zone is disposed directly in proximity to the inlet port; an improvement whereby the thermal energy consumed is efficiently utilized to expand perlite ore, sintering is minimized, improved perlite ore expansion is obtained, and equipment service life is extended, which improvement comprises:

(a) enclosing said inlet port and a delayed mixing gas burner in a first enclosure which is closed to the ambient atmosphere;

(b) providing said first enclosure with a cross-sectional area substantially greater than the cross-sectional area of said delayed mixing gas burner;

(c) providing a supply of air and a supply of fuel for combustion;

(d) separating the supply of air into a first air stream and a second air stream;

(e) mixing said first air stream with said supply of fuel and passing the resultant fuel/air mixture to said delayed mixing gas burner;

(f) controlling the relative proportions of air in said first stream and said second air stream such that the amount of air in said first air stream is that quantity which is at least sufficient to initiate and maintain minimal combustion of said fuel, but less than the amount which is required to obtain stoichiometric combustion of the fuel;

(g) passing said second air stream into a second enclosure which surrounds at least a portion of the wall of said expansion chamber and wherein said second air stream is heated by the heat passing through said wall of said chamber;

(h) passing the heated second air stream from said second enclosure through a conduit into said first enclosure;

(i) controlling the total amount of air provided such that the quantity of air is at least the amount necessary to obtain significant combustion of said fuel; and

(j) controlling the flow rate and ratio of said fuel and air such that a long luminous flame having a diameter substantially less than the diameter of said expansion chamber is produced throughout at least half the axial dimension of said expansion chamber, a moving laminar layer of air is created along the inner surface of said wall of said expansion chamber, and the length of the flame path and temperature of the flame zone are suited to the characteristics of the perlite ore feed.

2. A process as in claim 1 wherein the volumetric ratio of the amount of air in said first air stream to the amount of air in said second air stream is in the range of 1:9 to 3:2.

8. A process as in claim 1 and further comprising:

(a) passing said second air stream into said second enclosure at a location adjacent to the bottom of said expansion chamber.

4,347,156

SYSTEM AND PROCESS FOR REACTIVATING CARBON

Luis A. Lombana, Belmont; Daniel E. Myers, Palo Alto, both of Calif., and Orris E. Albertson, Salt Lake City, Utah, assignors to Lurgi Corporation, Belmont, Calif.

Continuation of Ser. No. 26,485, Apr. 2, 1979, abandoned. This application Feb. 11, 1981, Ser. No. 233,337

Int. Cl.³ B01J *20/34;* **C01B** *31/10;* **F23G** *5/04;* **F26B** *17/12*

U.S. Cl. 252—420 **5 Claims**

1. A process for reactivating wet spent activated carbon, in a furnace having at least a baking zone and a reactivating zone comprising:

a. heating the wet spent activated carbon in a drying means to drive off water as steam;

b. thereafter removing volatile organic chemicals by baking the carbon in a passing stream of gas in the baking zone to drive off the volatile organic chemicals and carry the chemicals out in the stream of gas;

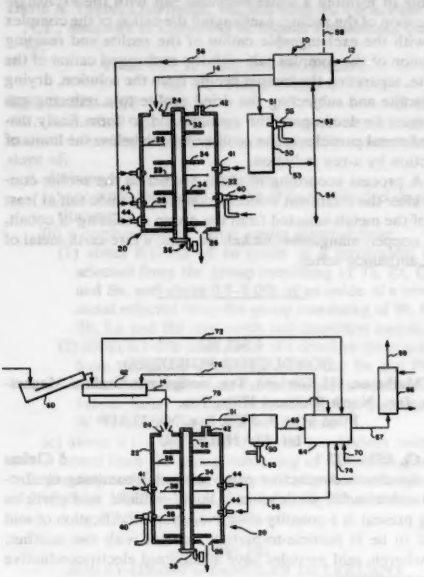
c. transferring steam which was evolved from the wet spent activated carbon to the reactivating zone;

d. reactivating the baked carbon in the reactivating zone in the presence of the steam substantially all of which was evolved from the wet spent activated carbon in the drying means;

e. transferring the gas containing volatile organic chemicals from the baking zone to an afterburner to burn the chemicals;

f. removing hot gas from the afterburner and bringing the gas into heat exchange relationship with the wet spent

activated carbon in the drying means to heat and dry the wet spent activated carbon and simultaneously provide a



source of steam for reactivation of the spent activated carbon.

4,347,157
CATALYSTS FOR THE POLYMERIZATION OF OLEFINS

Yasuharu Yamada, Osaka, and Kiyoshi Kawai, Toyonaka, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 7, 1980, Ser. No. 138,148

Claims priority, application Japan, Apr. 25, 1979, 54-51641; Jan. 28, 1980, 55-9200

Int. Cl.³ C08F *4/64, 4/68*

U.S. Cl. 252—429 B **19 Claims**

1. A solid catalyst component for olefin polymerization prepared by a method consisting essentially of reacting an organomagnesium compound represented by the formula,

$$R^5MgX \text{ or } R^6{}_2Mg$$

wherein R^5 and R^6 are each alkyl, aryl, aralkyl or alkenyl group having 1 to 20 carbon atoms, and X is a chlorine, bromine or iodine atom,

$$R^1{}_aAl(OR)_bX_c$$

with an alkoxy aluminum compound of the formula wherein R^1 and R^2 are each a hydrocarbon group having 1 to 20 carbon atom, X is a halogen atom and a,b, and c are numbers satisfying the equations at the same time,

$$0 \leq a < 3,\ 0 < b < 3,\ 0 \leq c < 3,\ a+b+c=3$$

to produce a solid product which is a catalyst carrier, and supporting a titanium compound and/or a vanadium compound on said solid product.

4,347,158
SUPPORTED HIGH EFFICIENCY POLYOLEFIN CATALYST COMPONENT AND METHODS OF MAKING AND USING THE SAME

Malcolm J. Kaus, Mohegan Lake, N.Y., and Nemesio D. Miro, Woodridge, N.J., assignors to Dart Industries, Inc., Los Angeles, Calif.

Filed May 2, 1980, Ser. No. 146,341

Int. Cl.³ C08F *4/64, 4/68, 4/62*

U.S. Cl. 252—429 B **18 Claims**

1. A method of producing a polymerization catalyst component suitable for use in the polymerization of alpha-olefins, comprising:

(a) co-comminuting a support base, an inorganic Lewis acid and a first organic electron donor to form a catalyst component support suitable for use in alpha-olefin polymerization, said support base selected from the group consisting of the Group IIA and IIIA salts and the salts of the multivalent metals of the first transition series with the exception of copper; and

(b) then co-comminuting said catalyst component support formed in step(a) with a polymerization-active tri-, tetra-, or penta-valent transition metal compound of a Group IVB-VIB metal.

4,347,159
ACTIVATORS FOR ZIEGLER TYPE POLYMERIZATION CATALYSTS

Walter Nudenberg, Newtown; Yong S. Rim, Woodbridge, and Demetreos N. Matthews, Bethany, all of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed May 23, 1980, Ser. No. 152,900

Int. Cl.³ C08F *4/68*

U.S. Cl. 252—429 B **19 Claims**

1. A catalyst composition comprising an activator in combination with a primary catalyst system, wherein said primary catalyst system comprises a vanadium compound and an organometallic compound of the formula RMgX, $LiAlR_4$, or $R_AAl_2X_B$, wherein R is a hydrocarbon radical having 1 to 12 carbon atoms, X is a halogen atom; A is a number from 2 to 6, and B is a number from 0 to 4, with the proviso that the sum of A and B is 6 and that at least one of the groups attached either to the vanadium compound or to the organometallic compound is a halogen atom, and said activator is a chlorinated tetrahydrofurfuryl tetrahydrofuroate, an alkyl ester of chlorinated tetrahydrofuroic acid wherein the alkyl group has 1 to 8 carbon atoms, a chlorinated alkylene bis-tetrahydrofuroate wherein the alkylene group has 2 or 3 carbon atoms, a chlorinated oxy-bis [alkylene (2-furoate)], wherein the alkylene group is ethanediyl, 1,3 propanediyl, alkyl substituted ethanediyl or alkyl substituted, 1,3 propanediyl wherein the alkyl group on the ethanediyl or 1,3 propanediyl has 1 to 8 carbon atoms.

4,347,160
TITANIUM HALIDE CATALYST SYSTEM

Ronald A. Epstein, and Robert I. Mink, both of Yonkers, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Jun. 27, 1980, Ser. No. 163,615

Int. Cl.³ C08F *4/64*

U.S. Cl. 252—429 B **54 Claims**

1. A catalyst system comprising:

(a) an organoaluminum containing component; and

(b) a titanium halide containing component obtained by:

(i) co-pulverizing a halogen containing magnesium compound with an electron-donor compound to produce a co-pulverized product;

(ii) reacting the co-pulverized product with an organic phosphite to produce a reaction product; and

(iii) reacting the reaction product with a titanium halide compound.

4,347,161
POLYMERIZATION OF OLEFINS

Richard E. Dietz, and Max P. McDaniel, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 3,439, Jan. 15, 1979, Pat. No. 4,240,929. This application Aug. 7, 1980, Ser. No. 176,218
The portion of the term of this patent subsequent to Dec. 23, 1997, has been disclaimed.
Int. Cl.³ C08F *4/64*
U.S. Cl. 252—429 B **23 Claims**

1. A catalyst composition obtained by milling a magnesium alkoxide with an intimate mixture of a magnesium dihalide and a tetravalent, halogenated titanium compound represented by the formula $TiX_a(OR')_{4-a}$ in which X stands for bromine, chlorine or iodine or mixtures thereof, a is an integer of 1 to 4 and R' is an alkyl, cycloalkyl, or aryl group and combinations thereof containing from 1 to about 20 carbon atoms in the presence of chlorinated silica.

4,347,162
CATALYST FOR THE POLYMERIZATION OF ALPHA-OLEFINS

Renzo Invernizzi, Milan; Ferdinando Ligorati, Usmate; Maurizio Fontanesi, Concorezzo, and Roberto Catenacci, Milan, all of Italy, assignors to Euteco Impianti S.p.A., Milan, Italy

Filed Mar. 6, 1981, Ser. No. 241,288
Int. Cl.³ C08F *4/64*
U.S. Cl. 252—429 B **16 Claims**

1. A Ziegler catalytic system formed by the combination of an organometallic compound of a metal of Group I, II or III of the Periodic System of the Elements and a catalytic component formed of a compound of a transition metal of Group IV, V or VI of said Periodic System supported on a carrier, characterized in that said carrier is an active solid complex obtained by reacting magnesium chloride with an aliphatic alcohol and a fluorine-containing compound at a temperature of from about 100° C. to about 200° C., said complex comprising from 2 to 15% by weight of fluorine and from 0.4 to 11% by weight of alcoholic hydroxyl groups.

4,347,163
TE-CONTAINING METHACROLEIN OXIDATION CATALYSTS AND THEIR USE

Wilfrid G. Shaw, Lyndhurst, and Christos Paparizos, Willowick, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Oct. 3, 1980, Ser. No. 193,865
Int. Cl.³ B01J *27/14*
U.S. Cl. 252—435 **8 Claims**

1. A catalytic composition of the empirical formula:

$$Mo_{12}P_{0.1\text{-}3}Te_{0.01\text{-}2}M_{0.1\text{-}3}M'_{0.01\text{-}3}X_aO_b \quad (I)$$

M is at least one of K, Rb and Cs;
M' is Cu or a combination of Cu and V;
X is at least one of Ba, Zn, Ga, Nb, Cd, Ti, Ca, Mg, Ta, Zr, Bi, Ce, Ce, Ni, Co, Cr, Fe and Tl when a >0;
a is a number of 0 to about 2; and
b is a number that satisfies the valence requirements of the other elements present.

4,347,164
MONO- AND POLY-METALLIC SUPPORTED CATALYSTS

Julius Scherzer, Anaheim, Calif., assignor to Filtrol Corporation, Los Angeles, Calif.

Filed Dec. 8, 1980, Ser. No. 214,212
Int. Cl.³ B01J *29/10, 29/20, 27/26*
U.S. Cl. 252—455 Z **7 Claims**

1. A process for preparing a zeolite containing uniformly distributed, finely divided metal particles which comprises treating a Y-type zeolite having a metal cation in exchangeable position with an aqueous solution containing a complex cyanide salt dissolved therein, the anion of the complex salt being capable of forming a water-insoluble salt with the exchangeable cation of the zeolite, exchanging the cation of the complex salt with the exchangeable cation of the zeolite and reacting the anion of the complex salt with the exchanged cation of the zeolite, separating the treated zeolite from the solution, drying the zeolite and subjecting the dried zeolite to a reducing gas treatment to decompose the cyanide and to form finely dispersed metal particles in the zeolite of a size below the limits of detection by x-ray radiation.

2. A process according to claim 1 wherein the zeolite contains after the treatment with the complex cyanide salt at least one of the metals selected from the group consisting of cobalt, iron, copper, manganese, nickel, tin, zinc, a rare earth metal of the Lanthanide series.

4,347,165
CONDUCTOR POWDERS

Neil Matheson, III, Garland, Tex., assignor to Graham Magnetics, Inc., North Richland Hills, Tex.

Filed Mar. 5, 1979, Ser. No. 17,419
Int. Cl.³ H01B *1/02*
U.S. Cl. 252—513 **5 Claims**

1. An electroconductive paint product, containing electroconductive metal particles in a liquid vehicle, said particles being present in a quantity effective, upon solidification of said paint, to be in particle-to-particle contact with one another, and wherein said particles have a stabilized electroconductive surface comprising

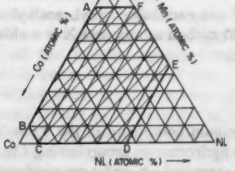
(a) a first reaction product of said electroconductive metal with an electroconductive carbide, nitride, boride or silicide and, also,

(b) an effective amount of second reaction product of said electroconductive metal with sulfur to form means to improve the stability of the electroconductivity of a coating formed of said paint to moisture and heat.

4,347,166
THERMISTOR COMPOSITION

Hiromi Tosaki; Hideo Arima; Teruo Mozume; Akira Ikegami, all of Yokohama; Tokio Isogai, and Ichiro Tsubokawa, both of Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 22, 1979, Ser. No. 14,276
Claims priority, application Japan, Feb. 22, 1978, 53/18461
Int. Cl.³ H01B *1/06*
U.S. Cl. 252—519 **8 Claims**



1. A thermistor material, which comprises a spinel complex metal oxide of a fired mixture of powder of manganese oxide and powder of ruthenium oxide with at least one of powder of cobalt oxide and powder of nickel oxide, the spinel complex metal oxide containing 0.5–40% by atom of ruthenium atom.

4,347,167
FINE-GRAIN SEMICONDUCTING CERAMIC COMPOSITIONS

David A. Payne, Champaign, Ill., and Sang M. Park, Penn Yan, N.Y., assignors to University of Illinois Foundation, Urbana, Ill.

Filed Oct. 1, 1980, Ser. No. 192,693
Int. Cl.³ H01B 1/06
U.S. Cl. 252—520 15 Claims

1. A method for producing a fine-grain semiconducting internal boundary layer ceramic composition comprising the steps of:

A. forming a mixture comprising:

(a) about 89–99.3% by weight of finely divided strontium titanate;

(b) a combination of metal oxides selected from

(1) about 0.1–5% of an oxide of a tetravalent metal selected from the group consisting of Ti, Zr, Ge, Si and Sn, and about 0.5–5.0% of an oxide of a trivalent metal selected from the group consisting of Bi, B, Fe, Sb, La and the rare earth and transition metals; and

(2) about 0.1–5% of an oxide of a divalent metal selected from the group consisting of Sr, Ca, Ba and Pb and about 0.5%–5% of an oxide of a pentavalent or hexavalent metal selected from the group consisting of W^{+6}, Nb^{+5}, Ta^{+5} and Mo^{+6}, and

(c) about 0.1–1.0% of an oxide of a univalent metal selected from the group consisting of Cu and Ag; and

B. pressing and firing the mixture of step A at a temperature of about 1200°–1400° C. for about 10–300 minutes.

4,347,168
SPRAY-DRIED GRANULAR DETERGENT COMPOSITIONS FOR IMPROVED GREASY SOIL REMOVAL

Alan P. Murphy, Cincinnati, Ohio; Rory J. M. Smith, Rowlands Gill, and Maxim C. Brooks, Newcastle upon Tyne, both of England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 959,039, Nov. 8, 1978, abandoned. This application Aug. 1, 1980, Ser. No. 174,486
Claims priority, application United Kingdom, Nov. 17, 1977, 47981/77
Int. Cl.³ C11D 1/86, 17/06
U.S. Cl. 252—547 12 Claims

1. A spray-dried granular detergent composition having improved odor characteristics and containing from about 6% to about 15% of a surface active system comprising:

(a) from about 10% to about 40% by weight of a cationic surfactant which is quaternary ammonium salt having one group which is a C_{12-18} alkyl or alkenyl, a second group which is methyl, a third group which is hydroxyethyl and a fourth group which is selected from the group consisting of methyl and hydroxyethyl;

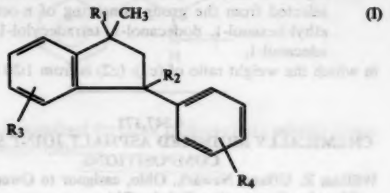
(b) at least about 50% by weight of a mixture of anionic and alkoxylated nonionic surfactants in a weight ratio of 3:1 to 1:3.

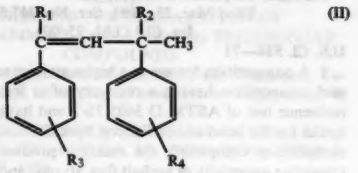
4,347,169
ELECTRICAL INSULATING OIL AND OIL-FILLED ELECTRICAL APPLIANCES

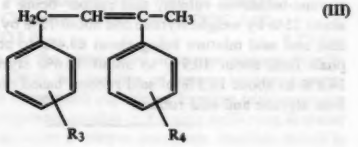
Atsushi Sato, Tokyo; Naoya Takahashi, Yokohama; Keiji Endo, Yokohama, and Hitoshi Yanagishita, Yokohama, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Tokyo, Japan

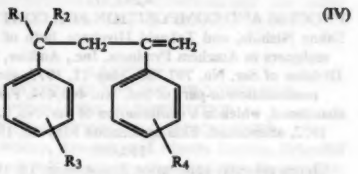
Filed Jun. 23, 1981, Ser. No. 276,709
Claims priority, application Japan, Jun. 30, 1980, 55-88924; Jun. 30, 1980, 55-88925; Jun. 30, 1980, 55-88926; Jul. 22, 1980, 55-99380; Jul. 22, 1980, 55-99381; Jul. 22, 1980, 55-99382
Int. Cl.³ H01B 3/00; H05K 5/00; H01B 7/02; H01G 4/22
U.S. Cl. 252—567 16 Claims

7. An oil-filled electrical appliance which is impregnated with an electrical insulating oil comprising at least one member of diarylalkanes and at least one member selected from the group consisting of the compounds represented by the general formulae (I) to (IV):


(I)


(II)


(III)


(IV)

wherein each of R_1 to R_4 is a hydrogen atom or a methyl group and the total number of carbon atoms in R_1 to R_4 is an integer from zero to 2.

15. The oil-filled electrical appliance in any one of claims 7 to 12, wherein the insulating material used in said oil-filled electrical appliance is insulating paper or synthetic resin film or their combination.

4,347,170
UNSATURATED POLYESTER COMPOSITIONS AND THEIR USE

Waltherus J. Sep, Doorn, and Adam Huijsman, Hasselt, both of Netherlands, assignors to Internationale Octrooi Maatschappij "Octropa" B.V., Rotterdam, Netherlands

Filed Oct. 6, 1980, Ser. No. 194,500
Claims priority, application United Kingdom, Oct. 12, 1979, 7935602
Int. Cl.³ C08L 91/06; C08K 5/03, 5/05
U.S. Cl. 523—511 7 Claims

1. An unsaturated curable polyester composition comprising:

(a) an unsaturated polyester which is derived from an ethylenically unsaturated dicarboxylic acid, a C_2–C_6 diol and optionally a saturated or hydro-aromatic dicarboxylic acid;

(b) a volatile reactive monomer selected from the group consisting of styrene, vinyl-toluene and α-methylstyrene in an amount of 30–60% by weight; and

(c) from 0.005 to 3% by weight of a combination of adjuncts comprising

(1) a paraffin wax having an average molecular weight of 250–700, and

(2) An alkylaromatic or alkenylaromatic compound having from 10 to 30 carbon atoms, or a mono-alcohol selected from the group consisting of n-octanol-1, 2-ethyl-hexanol-1, dodecanol-1, tetradecylol-1 and hexadecanol-1,

in which the weight ratio of (c1): (c2) is from 1:20 to 1:2.

4,347,171

CHEMICALLY MODIFIED ASPHALT JOINT SEALING COMPOSITIONS

William E. Uffner, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 25, 1981, Ser. No. 247,565
Int. Cl.³ C08L 95/00
U.S. Cl. 524—71 1 Claim

1. A composition for use as a highway joint sealing material, said composition having a recovery of at least 60% for the resilience test of ASTM D 3405-75-T and having at least five cycles for the bond test of Federal Specification SS-S-164, said composition comprising the reaction product of a mixture consisting essentially of asphalt flux, styrene and a vulcanizable styrene-butadiene rubber, said rubber being a copolymer of about 25% by weight styrene and about 75% by weight butadiene, and said mixture being about 69.4% to about 73.8% asphalt flux, about 10.9% to about 12.6% styrene and about 14.8% to about 18.3% of said rubber, based on the weight of flux, styrene and said rubber.

4,347,172

PROCESS AND COMPOSITION FOR COATING METALS

Takao Nishida, and Takashi Hirohata, both of Osaka, Japan, assignors to Amchem Products, Inc., Ambler, Pa.

Division of Ser. No. 797,758, May 17, 1977, abandoned, and a continuation-in-part of Ser. No. 445,434, Feb. 25, 1974, abandoned, which is a continuation of Ser. No. 232,625, Mar. 7, 1972, abandoned. This application May 15, 1980, Ser. No. 150,082
Claims priority, application Japan, Mar. 10, 1971, 46/012462
Int. Cl.³ C08L 9/06, 23/06
U.S. Cl. 524—319 34 Claims

1. An acidic aqueous coating composition for use in coating metal surfaces having a pH of about 1.6 to about 5.0 and comprising solid particles of resin dispersed in said composition, dissolved fluoride, and a ferric iron-containing compound which is soluble in said composition and which is a source of soluble ferric iron, the source of said soluble ferric iron including a source other than said metal surface, and wherein said soluble iron-containing compound is present in an amount such that it releases at least about 0.025 g/l of dissolved ferric iron into the composition, and wherein said ingredients are present in amounts such that the said composition is capable of forming on a metal surface immersed therein and in a substantially electrostatic field-free environment a resinous coating which increases in amount during at least a portion of the time said surface is immersed in said composition.

4,347,173

OPAQUE BLACK DYE FOR COLOR CODING OF WIRE ENAMELS, VARNISHES AND SYNTHETIC RESINS

Jacques S. Merian, and Gerald J. Schiller, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 6, 1980, Ser. No. 156,962
Int. Cl.³ C08L 77/06
U.S. Cl. 524—88 12 Claims

1. An organic wire enamel, varnish, or synthetic resin containing a phthalocyanine blue dye and a red dye which is a mixture of a rhodamine violet dye and a monoazo chromium complex yellow dye.

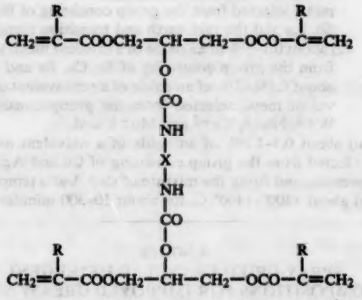
4,347,174

CEMENT COMPOSITIONS

Yoshinori Nagase; Kyoichiro Shibatani; Junichi Yamauchi, and Ikuo Omura, all of Kurashiki, Japan, assignors to Kuraray Company, Limited, Kurashiki, Japan

Filed Apr. 21, 1981, Ser. No. 256,154
Claims priority, application Japan, Apr. 29, 1980, 55-57598; Nov. 17, 1980, 55-162515
Int. Cl.³ A61K 6/08; C08K 3/36, 5/54; C08F 26/02
U.S. Cl. 523—116 34 Claims

1. In a cement composition which comprises (a) a filler, (b) a binder to be used in admixture with the filler, and (c) a curing agent for polymerizing the binder, the cement composition which is characterized by that said binder comprises, based on the total weight of the binder, 20–100% by weight of (A) a free-radical polymerizable monomer of the following formula:



wherein R is a hydrogen atom or a methyl group and X is an organic residue having 1–48 carbon atoms, and 0–80% by weight of (B) a mono-, di- or tri-functional free-radical polymerizable monomer which is copolymerizable with monomer (A).

4,347,175

METHOD FOR STABILIZATION OF POLYMERS

Olga A. Shustova, Grokholsky pereulok, 30, korpus 1, kv. 41; Georgy P. Gladyshev, Vinnitskaya, ulitsa 5, kv. 111, and Tamara P. Potapova, Bolshaya Cheremushkinskaya ulitsa, 1, korpus 2, kv. 64, all of Moscow, U.S.S.R.

Filed Nov. 23, 1977, Ser. No. 854,207
Int. Cl.³ C08K 5/09
U.S. Cl. 523—455 7 Claims

1. A method for stabilizing polymers susceptible to oxidative destruction which comprises intermixing a homopolymer or copolymer selected from the group consisting of epoxies, polyamides, polyimides, silicones and fluoroorganic polymers with a multi-valent metal formate in an amount ranging from 0.1 to 20 parts by weight per 100 parts by weight of the polymer, heat-treating the polymer-formate mixture at the decomposition temperature of the multi-valent metal formate for a time sufficient to completely decompose said formate.

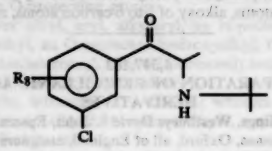
4,347,176

COMPOUNDS AND METHODS OF MAKING SAME

Nariman B. Mehta, Raleigh, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

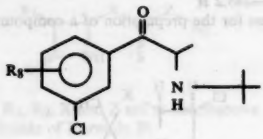
Filed Apr. 14, 1980, Ser. No. 140,157
Int. Cl.³ C07G 7/00; C07C 69/527, 101/30; G01N 33/54
U.S. Cl. 260—112 B 18 Claims

1. A compound of the formula



wherein R_8 is $(CH_2)_n$—O—$CO(CH_2)_p$—CO_2H where n is an integer from 1 to 5 and p is an integer from 1 to 4.

14. An immunogen comprising a conjugate comprising a compound of formula:



wherein R_8 is as defined for claim 1, coupled to a suitable immunogenic carrier material.

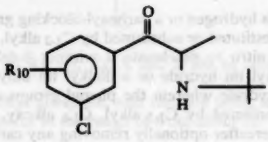
4,347,177

COMPOUNDS AND METHODS OF MAKING THEM

Arthur P. Phillips, Raleigh, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Apr. 14, 1980, Ser. No. 140,159
Int. Cl.³ C07G 7/00; C07C 103/30; G01N 33/54
U.S. Cl. 260—112 B 21 Claims

1. A compound of the formula



wherein R_{10} is O—$(CH_2)_p$COOH where p is an integer from 1 to 4.

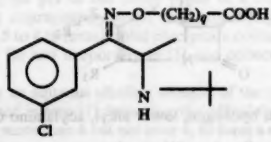
4,347,178

COMPOUNDS AND METHODS OF MAKING

John W. A. Findlay, Chapel Hill; Robert F. Butz, Durham, and Richard M. Welch, Raleigh, all of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

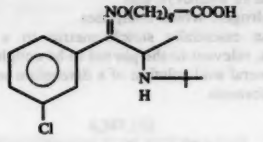
Filed Apr. 14, 1980, Ser. No. 140,160
Int. Cl.³ C07C 123/00, 131/00; G01N 33/54
U.S. Cl. 260—112 B 14 Claims

1. A compound of the formula



where q is an integer from 1 to 3.

11. An immunogen comprising a conjugate comprising a compound of formula



wherein q is as defined for claim 1, coupled to a suitable immunogenic carrier material.

4,347,179

PROCESS FOR THE PREPARATION OF IMMUNOGAMMAGLOBULIN USING TRITHIONATE COMPOUNDS

Syoji Ono, Kodaira; Shuzi Miura, Hino, and Tsunemasa Yoshida, Hachioji, all of Japan, assignors to Teijin Limited, Osaka, Japan

PCT No. PCT/JP79/00131, § 371 Date Jan. 23, 1981, § 102(e) Date Jan. 22, 1981, PCT Pub. No. WO80/02561, PCT Pub. Date Nov. 27, 1980
PCT Filed May 23, 1979, Ser. No. 233,611
Int. Cl.³ A61K 39/395, 39/44; C07G 7/00
U.S. Cl. 260—112 B 8 Claims

1. A process for the preparation of immunogammaglobulin derivatives in which the reaction of human immunogammaglobulin with a compound capable of forming trithionate ion and another compound capable of forming sulfite ion in water is carried out in water to cleave interchain disulfide bonds in said immunogammaglobulin and simultaneously the sulfur atoms cleaved are S-sulfonated (—S—SO_3^-).

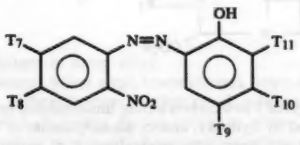
4,347,180

HIGH CAUSTIC COUPLING PROCESS FOR PREPARING SUBSTITUTED 2-NITRO-2'-HYDROXYAZOBENZENES

Roland A. E. Winter, Armonk, and Martin Dexter, Briarcliff Manor, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 38,768, May 16, 1979, Pat. No. 4,275,004, which is a continuation-in-part of Ser. No. 918,984, Jun. 26, 1978, Pat. No. 4,226,763. This application Jan. 5, 1981, Ser. No. 222,808
The portion of the term of this patent subsequent to Jun. 23, 1998, has been disclaimed.
Int. Cl.³ C07C 107/06; C07D 249/20; C09B 29/12
U.S. Cl. 260—206 11 Claims

1. A process for the production of a compound of the formula



wherein

T_7 is hydrogen or chlorine,

T_8 is hydrogen, chlorine, lower alkyl of 1 to 4 carbon atoms, lower alkoxy of 1 to 4 carbon atoms, carboalkoxy of 2 to 9 carbon atoms, carboxy or —SO_3H,

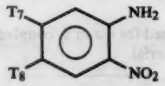
T_9 is alkyl of 1 to 12 carbon atoms, alkoxy of 1 to 4 carbon atoms, phenyl, phenyl substituted with alkyl groups, said alkyl groups having 1 to 8 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, carboalkoxy of 2 to 9 carbon atoms, chlorine, carboxyethyl or arylalkyl of 7 to 9 carbon atoms,

T_{10} is hydrogen, alkyl of 1 to 12 carbon atoms, lower alkoxy

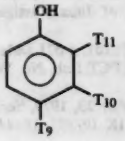
of 1 to 4 carbon atoms, aralalkyl of 7 to 9 carbon atoms, chlorine or hydroxyl, and

T_{11} is hydrogen, which comprises

adding an essentially stoichiometric to a small excess amount, relevant to the phenol to be coupled, of an aqueous mineral acid solution of a diazonium salt of an amine of the formula



where T_7 and T_8 are defined as above, to a strongly alkaline lower alkanol or aqueous lower alkanol solution of a phenol of the formula



where T_9, T_{10} and T_{11} are defined as above, containing alkali metal hydroxide in sufficient amount to neutralize completely the acid diazonium salt solution as added and to still provide an excess of hydroxyl ion concentration and to provide a pH value substantially over 11 throughout the coupling reaction in the reaction mixture, wherein the reaction solvent mixture is at least 50% by weight of lower alkanol, while maintaining the reaction temperature between −15° C. and +30° C., and

acidifying the reaction mixture to isolate the product.

4,347,181

INTERMEDIATES FOR PRODUCING BICYCLIC β-LACTAM-ANTIBIOTICS

Terence C. Smale, Epsom Downs, England, assignor to Beecham Group Limited, England

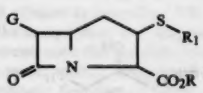
Division of Ser. No. 955,598, Oct. 30, 1978, Pat. No. 4,223,038. This application Feb. 11, 1980, Ser. No. 120,499

Claims priority, application United Kingdom, Dec. 11, 1977, 47201/77

Int. Cl.³ C07D *487/04*; A61K *31/40*

U.S. Cl. 260—245.2 T **29 Claims**

1. A compound of the formula



wherein

R_1 is alkyl of 1 to 6 carbon atoms, unsubstituted or monosubstituted by hydroxy, amino, alkanoylamino of 1 to 6 carbon atoms, benzyloxycarbonylamino, or p-nitrobenzyloxycarbonylamino; phenyl; or phenyl substituted by one or more members selected from the group consisting of halo, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, amino alkanoylamino of 1 to 6 carbon atoms, benzyloxycarbonylamino or p-nitrobenzyloxycarbonylamino;

R is alkyl of 1 to 6 carbon atoms, benzyl, p-nitrobenzyl, p-methoxybenzyl, phenacyl, p-bromophenacyl, 2,2,2-trichloroethyl, phthalidyl, phthalimidomethyl, α-ethoxycarbonylethyl or alkanoyloxymethyl of 1 to 6 carbon atoms, and

G is hydrogen, alkyl or alkenyl, said alkyl and alkenyl being unsubstituted or substituted by hydroxy, oxo, methoxycarbonyl, phenyl or phenyl substituted by alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, nitro or halo.

4,347,182

PREPARATION OF PENICILLANIC ACID DERIVATIVES

Peter J. Giddings, Westbury; David I. John, Epsom Downs, and Eric J. Thomas, Oxford, all of England, assignors to Beecham Group Limited, England

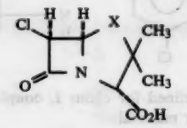
Filed Mar. 24, 1980, Ser. No. 133,627

Claims priority, application United Kingdom, Mar. 29, 1979, 7911038; May 3, 1979, 7915469; European Pat. Off., Jan. 7, 1980, 80300067.8; Japan, Jan. 10, 1980, 55/1720

Int. Cl.³ C07D *499/00*

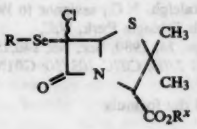
U.S. Cl. 260—245.2 R **5 Claims**

1. A process for the preparation of a compound of the formula (I):



(I)

wherein X is S, SO or SO_2, or a pharmaceutically acceptable salt or in-vivo hydrolysable ester thereof which process comprises reacting compound of the formula (II):



(II)

wherein R^x is hydrogen or a carboxyl-blocking group and R is phenyl unsubstituted or substituted by C_{1-3} alkyl, C_{1-3} alkoxy, hydroxy or nitro to deselenate it without 6-dehalogenation with a trialkyl tin hydride or a dialkyl tin dihydride or triphenyl tin hydride wherein the phenyl groups are unsubstituted or substituted by C_{1-3} alkyl, C_{1-6} alkoxy, hydroxy or nitro, and thereafter optionally removing any carboxyl-blocking group R^x; and/or oxidising the S atom to an SO or SO_2 group; and/or esterifying the salt of the compound of the formula (I) to yield an in-vivo hydrolysable ester thereof.

4,347,183

PROCESS FOR THE SYNTHESIS OF PENEMS AND CARBAPENEMS

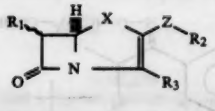
Adriano Afonso, West Caldwell, and Frank Hon, Paramus, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Feb. 2, 1981, Ser. No. 230,774

Int. Cl.³ C07D *499/04*

U.S. Cl. 260—245.2 R **16 Claims**

1. The process for the preparation of a compound of Formula I:



I

wherein R_1 is hydrogen, lower alkyl, acylamino or

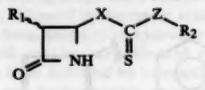
wherein R_4 is hydrogen, lower alkyl, aryl, heteroaryl and R_5 is an O-protecting group:

R_2 is lower alkyl, aryl, alkylaryl, an N-protected amino-lower alkyl, an O-protected hydroxyalkyl, thioalkyl, thioaryl, thioheteroaryl, an α-(N-protected) amino acid ester or an alkylcarboxylic acid ester;

R_3 is nitrile, tetrazole, or $—COOR_6$ wherein R_6 is lower alkyl, lower alkylthihalogenomethykl, aryl, allyl, or a metabolisable ester:

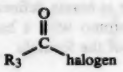
X and Z are independently sulfur, oxygen, $-NR_7$ wherein R_7 is acyl, alkyl, aryl, or an N-protecting group; or $—(CH_2)_n—$wherein n is 1 or 2;

which comprises the reaction of an azetidinone of Formula A:



A

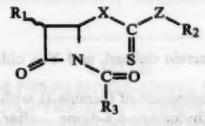
wherein R_1, R_2, X and Z are as hereinabove defined, with an acid halide of Formula B:



B

wherein in R_3 is as hereinabove defined,

in an inert solvent in the presence of a tertiary amine and an alkaline earth metal carbonate; followed by reaction of the thereby produced imido derivative of Formula C:



C

wherein in R_1, R_2, R_3, X and Z are as hereinabove defined:

with a trialkyl phosphite, said reaction being carried out at temperatures in the range of from about 20° to about 80° C.

4,347,184

PROCESS FOR SEPARATING AND RECOVERING COPROPORPHYRIN AND UROPORPHYRIN FROM A CULTURE BROTH CONTAINING THEM

Ichiro Kojima; Kenji Maruhashi, both of Yokohama, and Yasuo Fujiwara, Tokyo, all of Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Filed Mar. 25, 1981, Ser. No. 247,501

Claims priority, application Japan, Mar. 25, 1980, 55-036882

Int. Cl.³ C07D *207/00*

U.S. Cl. 260—314 **1 Claim**

1. A process for separating and recovering coproporphyrin III and uroporphyrin III from a cultured broth containing them, which comprises

(1) adjusting the pH of the liquid phase of a cultured broth containing coproporphyrin III and uroporphyrin III to a range of 2.5 to 4 to form a solid precipitate containing coproporphyrin III and uroporphyrin III and collecting the precipitate,

(2) preparing an aqueous alkaline solution of the solid precipitate obtained in step (1), adjusting the pH of the solution to a range of more than 4 but not over 6, to form a solid precipitate containing coproporphyrin III, and collecting the precipitate, and

(3) adjusting the pH of the residue left after collection of the precipitate in step (2) to a range of 1 to 4 to form a solid precipitate containing uroporphyrin III and collecting the precipitate.

4,347,185

PROCESSES FOR PREPARING 5-BENZOYL-7-HALO-1,2-DIHYDRO-3H-PYRROLO[1,2-A]PYRROLE-1-CARBOXYLIC ACIDS

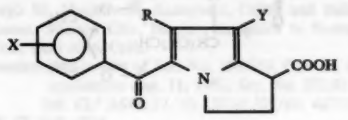
Joseph M. Muchowski, Sunnyvale, Calif., and Robert Greenhouse, Mexico City, Mexico, assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Oct. 20, 1980, Ser. No. 198,551

Int. Cl.³ A61K *31/40*; C07D *487/04, 209/00*

U.S. Cl. 260—326.25 **20 Claims**

1. A process for preparing a compound of the formula



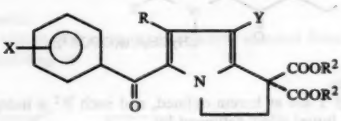
(VII)

wherein

R is hydrogen or lower alkyl;

X is hydrogen, lower alkyl, lower alkoxyl, lower alkoxycarbonyl, carboxyl, lower alkylcarbonyl, sulfonic acid, sulfonic acid alkyl ester, fluoro, chloro or bromo; and

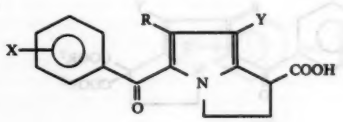
Y is chloro or bromo; which comprises decarboxylating a compound of the formula



(V)

wherein R, X, and Y are as herein defined and each R^2 is independently hydrogen or lower alkyl.

19. A process for preparing a compound of the formula



(VII)

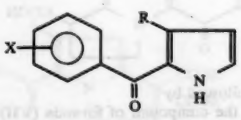
wherein:

R is hydrogen or lower alkyl;

X is hydrogen, lower alkyl, lower alkoxyl, lower alkoxycarbonyl, carboxyl, lower alkylcarbonyl, sulfonic acid, sulfonic acid alkyl ester, fluoro, chloro or bromo; and

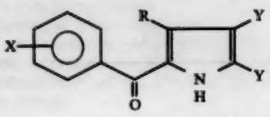
Y is chloro or bromo; which process comprises:

(a) treating a compound of the formula



(I)

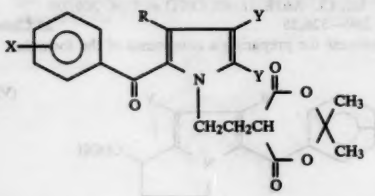
wherein R and X are as herein defined, with a halogenating agent to obtain a compound of the formula



(II)

wherein R, X and Y are as herein defined, followed by;

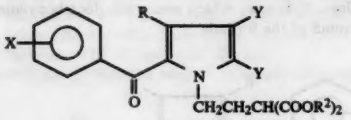
(b) treating the compound of formula II with spiro[2.5]-5,7-dioxa-6,6-dimethyloctane-4,8-dione after preliminary treatment of II with an alkali metal hydride in the presence of an aprotic organic solvent; to obtain a compound of the formula



(III)

wherein R, X and Y are as herein defined; followed by

(c) treating the compound of formula III with a lower alkyl alcohol in the presence of acid to obtain a compound of the formula

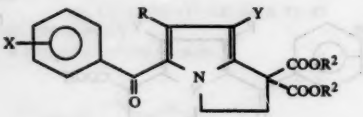


(IV)

wherein

R, X and Y are as herein defined, and each R^2 is independently lower alkyl; followed by

(d) treating the compound of formula IV with an alkali metal hydride in the presence of an aprotic organic solvent; to obtain a compound of the formula

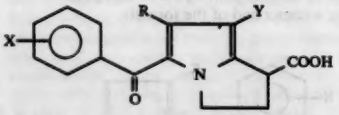


(V)

wherein

R, X Y and R^2 are as herein defined; followed by

(e) treating the compound of formula V with an inorganic base, and subsequently treating the resulting product with an inorganic acid to obtain a compound of formula

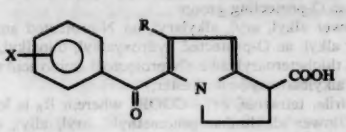


(VII)

optionally followed by

(f) converting the compound of formula (VII) to a corresponding pharmaceutically acceptable non-toxic ester or salt.

20. A process for preparing a compound of the formula



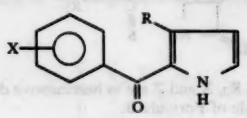
(VI)

wherein:

R is hydrogen or lower alkyl;

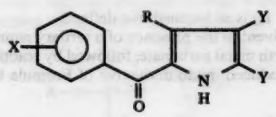
X is hydrogen, lower alkyl, lower alkoxyl, lower alkoxycarbonyl, carboxyl, lower alkylcarbonyl, sulfonic acid, sulfonic acid alkyl ester, or fluoro, which process comprises:

(a) treating a compound of the formula



(I)

wherein R and X are as herein defined, except that X may also be chloro or bromo with a halogenating agent to obtain a compound of the formula

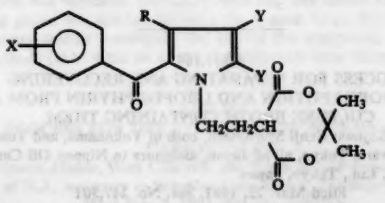


(II)

wherein

R and X are as herein defined, and Y is chloro or bromo, followed by;

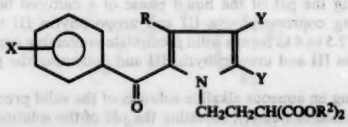
(b) treating the compound of formula II with spiro[2.5]-5,7-dioxa-6,6-dimethyloctane-4,8-dione after preliminary treatment of II with an alkali metal hydride in the presence of an aprotic organic solvent; to obtain a compound of the formula



(III)

wherein R, X and Y are as herein defined; followed by

(c) treating the compound of formula III with a lower alkyl alcohol in the presence of acid to obtain a compound of the formula



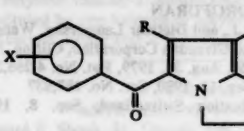
(IV)

wherein

R, X and Y are as herein defined, and each R^2 is independently lower alkyl; followed by

(d) treating the compound of formula IV with an alkali metal

hydride in the presence of an aprotic organic solvent; to obtain a compound of the formula



(V)

wherein

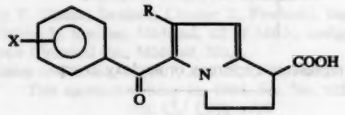
R, X Y and R^2 are as herein defined; followed by

(e) treating the compound of formula V with either

(1) hydrogen and hydrogenation catalyst, followed by inorganic base, followed by inorganic acid, or

(2) inorganic base, followed by hydrogen and hydrogenation catalyst, followed by inorganic acid, or

(3) inorganic base, followed by inorganic acid, followed by hydrogen and hydrogenation catalyst to obtain a compound of formula



(VI)

wherein R and X are as herein defined except that X cannot be chloro or bromo, optionally followed by

(f) converting the compound of formula (VI) to a corresponding pharmaceutically acceptable non-toxic ester or salt.

4,347,186

PROCESS FOR PREPARING 5-AROYL 1,2-DIHYDRO-3-H PYRROLO[1,2-A]PYRROLE-1-CARBOXYLIC ACIDS AND NOVEL INTERMEDIATES THEREIN

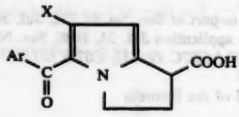
Joseph M. Muchowski, Sunnyvale, Calif., and Robert Greenhouse, Mexico City, Mexico, assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Oct. 20, 1980, Ser. No. 198,552

Int. Cl.³ A61K *31/40*; C07D *209/00*, *487/04*

U.S. Cl. 548—516 **35 Claims**

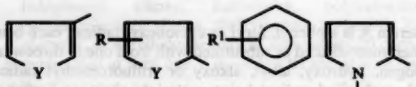
1. A process for preparing a compound of the formula



(I)

wherein:

X is hydrogen or lower alkyl; Ar is a moiety selected from the group consisting of



(IA), (IB), (IC) and (ID)

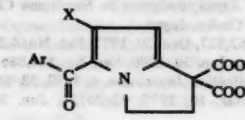
in which:

Y is oxygen or sulfur;

R is hydrogen, methyl, chloro, or bromo;

R^1 is hydrogen, lower alkyl, lower alkoxyl, lower alkoxycarbonyl, lower alkylcarbonyl, fluoro, chloro or bromo,

R^2 is hydrogen or lower alkyl; which comprises decarboxylating a compound represented by the formula



(II)

wherein X and Ar are as defined previously, and R^3 is hydrogen or lower alkyl.

4,347,187

PROCESS FOR PREPARING 5-AROYL 1,2-DIHYDRO-3H-PYRROLO[1,2-A]PYRROLE-1-CARBOXYLIC ACIDS AND NOVEL INTERMEDIATES THEREIN

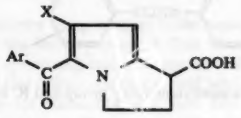
Joseph M. Muchowski, Sunnyvale, Calif., and Robert Greenhouse, Mexico City, Mexico, assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 198,552, Oct. 20, 1980. This application Jun. 11, 1981, Ser. No. 272,818

Int. Cl.³ A61K *31/40*; C07D *209/00*, *487/04*

U.S. Cl. 548—516 **41 Claims**

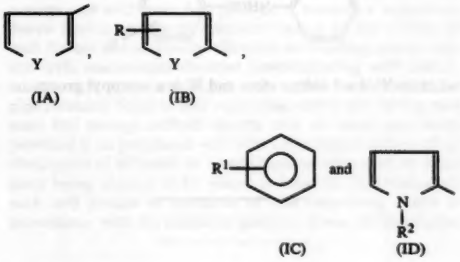
1. A process for preparing a compound of the formula



(I)

wherein:

X is chloro or bromo; Ar is a moiety selected from the group consisting of



(IA) (IB) (IC) (ID)

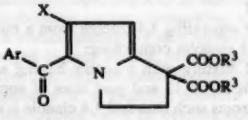
in which:

Y is oxygen or sulfur;

R is hydrogen, methyl, chloro, or bromo;

R^1 is hydrogen, lower alkyl, lower alkoxyl, lower alkoxycarbonyl, lower alkylcarbonyl, fluoro, chloro or bromo,

R^2 is hydrogen or lower alkyl; which process comprises decarboxylating a compound represented by the formula



(II)

wherein X and Ar are as defined previously, and R^3 is hydrogen or lower alkyl.

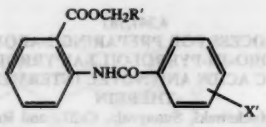
4,347,188

N-BENZOYLANTHRANILATE DERIVATIVES

Osamu Kirino, Ashiya; Toshiro Kato, Ibaraki, and Shigeo Yamamoto, Ikeda, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

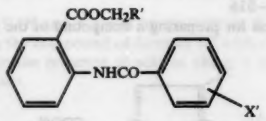
Division of Ser. No. 862,527, Dec. 20, 1977, Pat. No. 4,235,925.
This application Jun. 30, 1980, Ser. No. 164,886
Claims priority, application Japan, Jan. 6, 1977, 52/693; Feb. 8, 1977, 52/13447; Mar. 10, 1977, 52/26727; Jun. 3, 1977, 52/65973
Int. Cl.³ C07D *317/44*
U.S. Cl. 549—436 9 Claims

1. A compound of the formula,



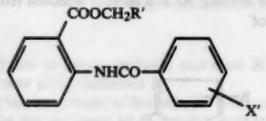
wherein X′ is a 2,4-dimethoxy group and R′ is an n-propyl group.

3. A compound of the formula,



wherein X′ is a 3,4-methylenedioxy group and R′ is an ethyl or n-propyl group.

4. A compound of the formula,



wherein X′ is a 3-iodine atom and R′ is a n-propyl group.

4,347,189

PROCESS FOR SEPARATING 1,4 CINEOLES FROM 1,8 CINEOLES

Theodore P. Goldstein, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 11, 1981, Ser. No. 262,165
Int. Cl.³ C07D *311/02, 307/77*
U.S. Cl. 549—397 17 Claims

1. A method of separating 1,4 cineole from a mixture comprising 1,4 and 1,8 cineoles comprising:

contacting said mixture with a zeolite having a constraint index of from 0.2 to 12 and port sizes of approximately 6.7–7.0 angstroms such that said 1,4 cineole is sorbed into said zeolite;

separating said zeolite and said mixture; and

desorbing said 1,4 cineole from said zeolite.

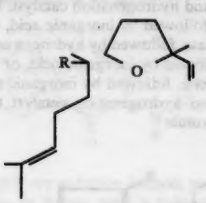
4,347,190

2-METHYL-2-VINYL-5-(1′-HYDROXY OR ACYLOXY-1′,5′-DIMETHYL-HEX-4′-EN-1′-YL)TETRAHYDROFURAN

Roman Kaiser, Clifton, N.J., and Dietmar Lamparsky, Wangen, Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 71,160, Aug. 30, 1979, Pat. No. 4,255,337.
This application Sep. 12, 1980, Ser. No. 187,937
Claims priority, application Switzerland, Sep. 8, 1978, 9470/78
Int. Cl.³ C07D *307/17, 307/16*
U.S. Cl. 549—497 3 Claims

1. Compounds of the formula



wherein R represents a hydroxy or acyloxy group.

4,347,191

PROCESS FOR THE PREPARATION OF 5-DIMETHYLAMINOMETHYL-2-FURANMETHANOL

John Cooper, Tonbridge Wells, and Dennis V. Lee, Leeds, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Filed Mar. 5, 1981, Ser. No. 240,651
Claims priority, application United Kingdom, Mar. 8, 1980, 8007943
Int. Cl.³ C07D *307/52*
U.S. Cl. 549—492 5 Claims

1. A process for preparing 5-dimethylaminomethyl-2-furanmethanol which comprises subjecting 2-furan-methanol to a Mannich reaction accomplished using bis(dimethylamino)methane.

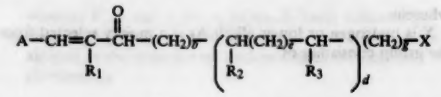
4,347,192

DERIVATIVES OF α,β-UNSATURATED KETONES

Richard A. Mueller, Glencoe, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Continuation-in-part of Ser. No. 61,732, Jul. 30, 1979, abandoned. This application Jul. 24, 1980, Ser. No. 171,877
Int. Cl.³ C07C *49/235;* C07D *307/20*
U.S. Cl. 549—498 21 Claims

1. A compound of the formula



wherein A is a phenyl, furyl or cyclohexyl radical, each being either unsubstituted or substituted with from one to three nitro, halogen, hydroxy, alkyl, alkoxy or trifluoromethyl radical, with each alkyl radical being a straight-chain or branched-chain group containing from 1 to 6 carbon atoms and with each alkoxy radical being a straight-chain or branched-chain group containing from 1 to 4 carbon atoms the substitutions each being the same or different; R_1 is hydrogen or a methyl radical; b and g are each an integer from 0 to 5; d and e are each 0 to 1; the sum of b, e, g and 2d is an integer from 3 to 5; when e is 0 or 1, R_2 and R_3 are a hydrogen, methyl, ethyl or phenyl radical R_2 and R_3 being the same or different, the phenyl

radical being unsubstituted or substituted by a halo or alkyl radical containing from 1 to 3 carbon atoms or, when e is 0, R_2 and R_3 are interconnected to form, together with the intervening ethylene radical, a phenyl ring that is unsubstituted or substituted by one halogen or alkyl radical containing from 1 to 3 carbon atoms; and X is hydroxy or halogen.

4,347,193

ARYL BORANE COMPLEXES

Howard E. Shook, Jr., Orange, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 20, 1979, Ser. No. 31,978
Int. Cl.[2] C07F *15/04*
U.S. Cl. 260—439 R 4 Claims

1. A compound having the general formula $Ni[NH_3]_4[(NC)B(C_6H_4\text{-}R)_3]_2$ wherein R is selected from the group consisting of hydrogen, halogen, alkyl groups having 1–6 carbon atoms and aryl groups having 6–10 carbon atoms.

4,347,194

POLYHYDROXYL POLYETHER COMPOUNDS CONTAINING PHOSPHORUS

Sally P. Ginter, Sanford; Chester E. Pawloski, Bay City, and Violete L. Stevens, Midland, all of Mich., assignors to The Dow Chemical Co., Midland, Mich.

Division of Ser. No. 162,707, Jun. 25, 1980, Pat. No. 4,298,709.
This application May 11, 1981, Ser. No. 262,264
Int. Cl.[3] C07F *9/09*
U.S. Cl. 260—929 9 Claims

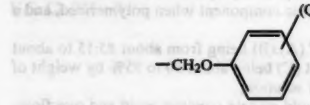
1. Compounds of the formula:

$$R\{\text{-}C_2H_3(Y)O\text{-}_mX\}_n$$

where

R is the residue left by the removal of n active hydrogen atoms from an initiator compound for alkylene oxide polymerization RH_n;

Y is independently —H, —CH_3, —C_2H_5, —CH_2Cl, —CH_2CCl_3, —CH_2Br,



where

Q is independently —Cl or —Br and a=1-5, or —CH_2OX where

X is independently —H or

and

R′ and R″ are each independently alkyl, phenyl, haloalkyl, halophenyl, alkoxy, haloalkoxy, polyhaloalkoxy, polyhalophenoxy alkoxy, dialkylamino, arylamino, halophenoxy, or alkylhalophenoxy of up to about 20 carbons; provided that at least one Y is —CH_2OH and at least one Y is

and

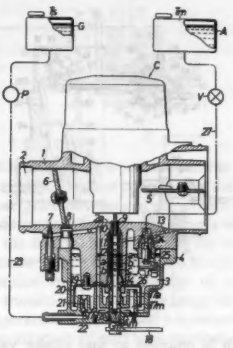
m and n are integers such that m is at least 2, n being 1–8.

4,347,195

CARBURETOR

Kouhei Ogawa, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1981, Ser. No. 248,300
Claims priority, application Japan, Mar. 31, 1980, 55-41617
Int. Cl.[3] F02M *13/06*
U.S. Cl. 261—18 R 4 Claims



1. A carburetor comprising an intake passage, a main nozzle opening to the intake passage, a float chamber, a main fuel passage for connecting said main nozzle with said float chamber, a slow fuel nozzle opening to said intake passage, a slow fuel passage for connecting said slow fuel nozzle with said main fuel passage, a change-over valve interposed between said main fuel passage and said slow fuel passage, said change-over valve being provided with main jet ports of different diameters and slow jet ports of different diameters for changing the degree of communications between said main fuel passage and said float chamber and between said slow fuel passage and said main fuel passage, a stationary supporting sleeve having groups of apertures formed in the peripheral wall thereof and an annular chamber surrounding said peripheral wall, said annular chamber communicating with said intake passage upstream of said main nozzle, and an air bleed pipe rotatably fitted in said supporting sleeve and having said main fuel passage defined therein, said air bleed pipe being provided in its peripheral wall with a plurality of groups of air bleed ports of different air bleed characteristics, said air bleed ports being adapted to be placed in selective communication with said groups of apertures of said supporting sleeve in accordance with the rotational position of said air bleed pipe.

4,347,196

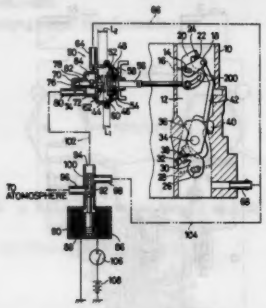
CARBURETOR EQUIPPED WITH AN AUTO-CHOKE DEVICE

Shigeyuki Kenma, Ibaraki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 24, 1980, Ser. No. 114,969
Claims priority, application Japan, Jan. 24, 1979, 54-6058
Int. Cl.[3] F02M *1/14*
U.S. Cl. 261—39 B 5 Claims

1. In a carburetor equipped with an auto-choke device for an internal combustion engine, comprising a choke valve arranged in a suction passage of said carburetor and a throttle valve arranged in said suction passage downstream of said choke valve, the improvement comprising vacuum motor means responsive to a negative pressure generated downstream of said throttle valve for opening said choke valve to a predetermined first degree when the engine temperature is below a set temperature and to a predetermined second degree

which is greater than said first degree when the engine temperature is at or above said set temperature, said vacuum motor means including a negative pressure chamber into which said negative pressure generated downstream of said throttle valve is introduced, and means for communicating said negative pressure chamber with atmospheric pressure to prevent said vacuum motor means from opening said choke valve to said second degree of opening from said first degree of opening when the engine temperature is below said set temperature, wherein said vacuum motor means includes a diaphragm which defines at least a portion of said negative pressure chamber and which is coupled to said choke valve by coupling means so as to open said choke valve when the negative pressure has been introduced into said negative pressure chamber, and wherein said means for communicating said negative pressure chamber with atmospheric pressure includes a leak valve means which introduces the negative pressure of said negative pressure chamber into a leak chamber when said diaphragm has shifted a first predetermined distance and opened said choke valve said predetermined first degree, means being provided for communicating said leak chamber with atmospheric pressure when the engine temperature is below said set temperature.

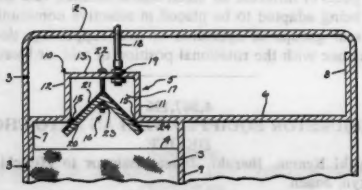


4,347,197

WATER DISTRIBUTOR

Randolph B. Cox, Madison, Wis., assignor to Research Products Corporation, Madison, Wis.

Filed May 12, 1980, Ser. No. 148,775
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—106 **9 Claims**



1. A distributor for the uniform supply of water from a water input line operating at line pressure to an extended area disposed therebeneath, said distributor comprising:

(a) means forming an elongated chamber adapted for connection with said water line, said chamber having at least one elongated restrictive gap disposed in its lower portion,

(b) means disposed in said gap for causing the formation of a miniscus across said gap as water flows into said chamber from said water line, to thereby prevent water from flowing through said gap,

(c) said chamber being enclosed and being generally sealed above said gap so that said chamber becomes pressurized below the said line pressure as water rises therein whereby said miniscus is ultimately broken by the rising pressure within said chamber to permit water to be discharged downwardly through said gap,

(d) said gap being defined by:

(1) a corner disposed in a chamber wall,

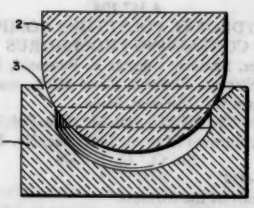
(2) and a flow control assembly disposed adjacent said corner and generally tangential thereto.

4,347,198

PRODUCING SOFT CONTACT LENSES

Shinzo Ohkada, Kyoto, and Hideki Kenjo, Otsu, both of Japan, assignors to Toray Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 940,318, Sep. 7, 1978, abandoned. This application Sep. 25, 1980, Ser. No. 190,820
Claims priority, application Japan, Sep. 12, 1977, 52/108925; Sep. 12, 1977, 52/108926
Int. Cl.³ B29D *11/00*
U.S. Cl. 264—2.3 **11 Claims**



1. A process for producing a soft contact lens comprising:

pouring an excess amount of an original solution for producing a soft contact lens into a concave mold which is placed in a vessel,

said original solution comprising a component (A) selected from the group consisting of hydrophilic polymers and monomers which yield a hydrophilic component when polymerized, a component (B) selected from the group consisting of hydrophobic polymers and monomers which yield a hydrophobic component when polymerized, and a solvent (C),

the weight ratio of (A):(B) being from about 85:15 to about 55:45 and solvent (C) being about 50 to 95% by weight of the total original solution;

placing a convex mold on said concave mold and overflowing the excess of said original solution, the vapor pressure of the lowest boiling component in said original solution inside said vessel being at least about 20% of the saturated partial pressure exhibited by said original solution;

gelling said original solution between the two molds to form therebetween a lens having a tensile strength of at least about 0.1 kgf/cm^2;

immersing said lens and said two molds in a liquid to peel said lens from said molds; and

extracting the thus-peeled lens by an extraction treatment with water.

4,347,199

METHOD AND APPARATUS FOR RAPIDLY FREEZING MOLTEN METALS AND METALLOIDS IN PARTICULATE FORM

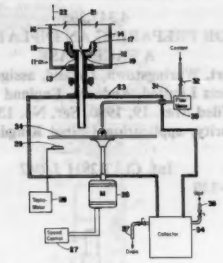
John L. Speier, Midland, Mich., and Thomas M. Gentle, Richmond, Calif., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 2, 1981, Ser. No. 239,306
Int. Cl.³ B01J *2/14*
U.S. Cl. 264—8 **6 Claims**

1. A method for rapid freezing of metals and metalloids in particulate form from a melt of such materials, the method comprising:

rotating a substantially horizontally mounted disc-like member at high speed,

introducing a stream of volatile liquid coolant at the center of rotation of said disc-like member in sufficient quantity to provide an outwardly flowing film of coolant liquid over substantially the entire upper surface of the disc-like member, and



introducing molten material into the film of liquid coolant on the rotating disc-like member at a distance spaced from the center of rotaion of the member,

whereby said molten material is cooled to the solid state by vaporization of the liquid coolant and dispersed by centrifugal forces acting upon the coolant and material.

4,347,200

METHOD OF PRODUCING MICROSPHERES BY VIBRATIONS

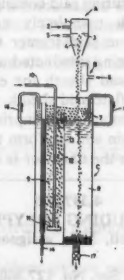
Giovanni Bezzi, Bagnacavallo; Ego Pauluzzi, Bologna, and Mauro Zanardi, Filattiera, all of Italy, assignors to Agip Nucleare S.p.A., Rome, Italy

Division of Ser. No. 895,365, Apr. 11, 1978, Pat. No. 4,285,645. This application Mar. 24, 1980, Ser. No. 132,889

Claims priority, application Italy, Apr. 15, 1977, 22498 A/77

Int. Cl.³ B01J *2/04, 2/06*

U.S. Cl. 264—9 **1 Claim**



1. A method of producing microspheres or spherules from a solution of a solidifiable material, which comprises:

(a) forming, in a vibratory apparatus, a string of droplets of said solution;

(b) passing said string of droplets through an inert, non-gelling gas shield before said droplets exit the droplet-forming apparatus;

(c) passing a stream of a reacting gelling gas as to impinge upon said droplets as they emerge from the droplet-forming apparatus to effect pre-gelling of said droplets;

(d) passing said pre-gelled droplets to a cushioning foam layer overlying a solution of a gelling agent; and

(e) passing said droplets through said solution of gelling agent to effect final gelling.

4,347,201

PROCESS AND APPARATUS FOR PRODUCING A TEMPERATURE SENSITIVE ELEMENT

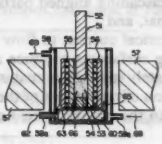
Masato Sagawa, and Wataru Yamagishi, both of Yokohama, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 31, 1979, Ser. No. 89,737

Claims priority, application Japan, Nov. 4, 1978, 53-135149

Int. Cl.³ C04B *35/50*

U.S. Cl. 264—24 **4 Claims**



1. A process for producing a polycrystalline temperature-sensitive ferromagnetic element comprising the steps of:

compacting fine grain powders of a spin reorientation type ferromagnetic material while applying a magnetic field and heating the fine grain powders of the spin reorientation type ferromagnetic material to a temperature higher than a transition temperature range of said material, wherein the transition temperature range of said material is room temperature or above and wherein the easy direction of magnetization of said spin reorientation type ferromagnetic material is uniformly parallel to the basal planes (P) of the grain powder crystals below the transition temperature range and the easy direction of magnetization is uniformly parallel to the A axes of the grain powder crystals above the transition temperature range; and

producing from the compacted spin reorientation type ferromagnetic material a polycrystalline temperature sensitive element, in which the easy direction of magnetization is uniformly oriented and reoriented at the transition temperature range of the material,

said spin reorientation type material being a rare earth cobalt alloy material generally expressed by a formula of RCo_5, wherein the T component is one rare earth element selected from a group consisting of neodymium (Nd), dysprosium (Dy), and terbium (Tb) and the Co component consists of cobalt or is cobalt and an additive metal which partly replaces the cobalt.

4,347,202

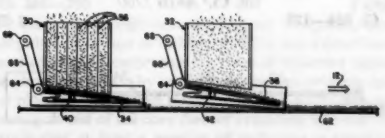
METHOD FOR PRODUCTION OF DIRECTIONALLY ORIENTED LIGNOCELLULOSIC PRODUCTS, INCLUDING MEANS FOR CROSS-MACHINE ORIENTATION

David J. Henckel, and Thomas E. Peters, both of Boise, Id., assignors to Morrison-Knudsen Forest Products Co., Inc., Boise, Id.

Filed Feb. 2, 1981, Ser. No. 230,691

Int. Cl.³ B06B *1/02*

U.S. Cl. 264—24 **9 Claims**



1. A method of forming a continuous mat of directionally oriented lignocellulosic particles and depositing the mat on a mat-receiving surface in a direction substantially transverse to the direction of movement of the mat-receiving surface, comprising:

providing a high-voltage orienting zone generating a directional electrical field substantially transverse to the direction of movement of the mat-receiving surface for alignment of particles generally transverse to the direction of movement thereof,

cascading a multitude of lignocellulosic particles through the orienting zone for electrostatic alignment thereof with their longer dimension generally parallel to the electrical lines of force within the orienting zone,

moving a mat-receiving surface below the orienting zone to receive the cascading aligned particles thereon to form a continuous mat, and

causing an electrical current to flow within the mat on the mat-receiving surface to produce a directional electrical field immediately above the mat substantially transverse to the direction of movement of the mat-receiving surface and parallel to the electrical field of the orienting zone.

4,347,203

PROCESS FOR PRODUCING ACRYLIC FIBER

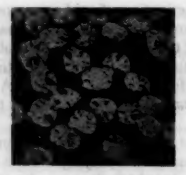
Koji Mimura, Hiroshima; Yasunori Kawachi, Ohtake, and Atsushi Kawai, Hiroshima, all of Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Filed May 22, 1980, Ser. No. 152,172

Claims priority, application Japan, May 30, 1979, 54-67185; Jun. 5, 1979, 54-70415

Int. Cl.³ B29D *27/00*; B29F *3/10*

U.S. Cl. 264—41 **4 Claims**



1. A method for producing an acrylic fiber, which comprises wet-spinning a spinning solution having a viscosity of about 30 to 60 poises, as measured at 50° C. and containing acrylonitrile polymer, under such spinning conditions that the ratio of spinning draft to maximum spinning draft is in the range of 0.5 to 0.9 and subjecting the spun filament to successive washing, drawing and drying treatments to produce a fiber which is covered on the outside with creases running along the fiber axis, adjacent creases being 0.1 to 5μ apart on the average; which has in any of its cross-sections two or more macrovoids, 2μ or more in major diameter, which extend in the direction of fiber axis; and which has 30 to 150 microcrimps per 25 mm of fiber length.

4,347,204

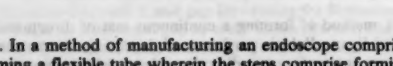
FLEXIBLE TUBE AND METHOD OF MANUFACTURING SAME

Takeji Takagi, Machida, and Kiyokazu Hosaka, Fuchu, both of Japan, assignors to Olympus Optical Co., Ltd., Japan

Division of Ser. No. 73,712, Sep. 10, 1979, Pat. No. 4,279,245. This application Jul. 17, 1980, Ser. No. 169,596

Int. Cl.³ A61B *1/00*

U.S. Cl. 264—127 **8 Claims**



1. In a method of manufacturing an endoscope comprising forming a flexible tube wherein the steps comprise forming a tubular body of a crystalline polymer material having a porous microstructure including a number of micro-nodes which are coupled together by fibrils, applying a solution of synthetic resin material having gas tightness and stretchability to one of the internal and external peripheral surfaces of the tubular body, and subsequently applying a pressure or suction to either peripheral surface of the tubular body to cause the solution of the synthetic resin material to permeate into the pores of the porous microstructure of the tubular body, thus filling the pores.

4,347,205

PROCESS FOR PREPARING AN INFLATABLE PAD FOR A FACE MASK

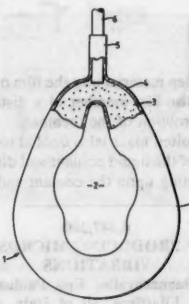
Mervin Stewart, Waringstown, Ireland, assignor to Warne Surgical Products Limited, Andover, England

Filed Mar. 19, 1980, Ser. No. 131,743

Claims priority, application United Kingdom, Apr. 3, 1979, 7911512

Int. Cl.³ B29H *3/042*

U.S. Cl. 264—130 **9 Claims**



1. A process for preparing an inflatable pad for a face mask comprising providing a substantially planar former which is shaped to correspond with the desired configuration of the pad, coating all surfaces of said former with a curable composition which when cured is elastic, air-impermeable and releasable from said former, curing said coating to provide an elastic air-impermeable sheath completely covering said former which is releasable from said former to define an inflation chamber, the coating being conducted in such a manner as to provide a conduit in said sheath for entry of gas into said inflation chamber to inflate said sheath, the former remaining within the inflation chamber and comprising a flexible material which will remain within and conform to the contours of the inflation chamber when the chamber is inflated.

4,347,206

METHOD OF EXTRUDING POLYPROPYLENE YARN

John S. Roberts, Howell, N.J., assignor to Kling-Tecs, Inc., Mantoloking, N.J.

Continuation-in-part of Ser. No. 127,360, Mar. 15, 1980, Pat. No. 4,303,606, which is a continuation of Ser. No. 893,371, Apr. 4, 1978, Pat. No. 4,193,961. This application Jan. 27, 1981, Ser. No. 229,012

The portion of the term of this patent subsequent to Dec. 1, 1998, has been disclaimed.

Int. Cl.³ D01D *5/12*

U.S. Cl. 264—176 F **16 Claims**

1. A method of producing a multi-filament polypropylene yarn, comprising:

heating polypropylene having a narrow molecular weight distribution with a swell value of less than 2.5 to a temperature at which it is molten;

extruding the molten polypropylene at a temperature less than 350° F. into a plurality of filaments;

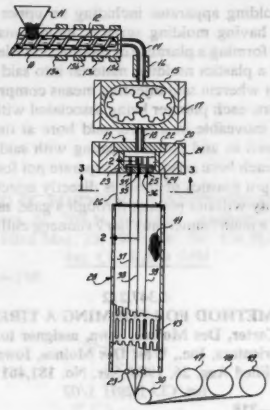
passing the filaments through a first zone having a tempera-

ture sufficiently high to retard cooling of the filaments therein;

drawing-down the filaments to their undrawn denier in said first zone;

then passing the filaments through a second zone; and

directing cooling gas over the filaments in said second zone to cool them;



the combination of the swell value of the polypropylene, the temperature of extrusion, and the temperature of said first zone interacting to substantially eliminate the occurrence of resonance in the filaments as they are drawn-down in said first zone.

4,347,207

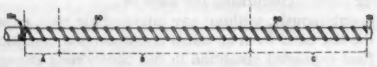
METHOD OF EXTRUDING POLYPROPYLENE YARN

John S. Roberts, Howell, N.J., assignor to Kling-Tecs, Inc., Mantoloking, N.J.

Continuation-in-part of Ser. No. 229,012, Jan. 27, 1981, which is a continuation-in-part of Ser. No. 127,360, Mar. 15, 1980, Pat. No. 4,303,606, which is a continuation of Ser. No. 893,371, Apr. 4, 1978, Pat. No. 4,193,961. This application Mar. 17, 1981, Ser. No. 244,810

Int. Cl.³ D01D *5/22*

U.S. Cl. 264—176 F **12 Claims**



1. A method of extruding solution dyed polypropylene filaments, comprising:

feeding a mixture of polypropylene pellets and color concentrate to a screw of an extruder having a length/diameter ratio of at least 25:1, said screw having a screw flight extending the effective length of said screw, said screw flight defining a feed section, a transition section, and a metering section, the depth of undercut of said screw flight decreasing through said transition section in the direction of feed with the ratio of the depth of said undercut in said feed section to that in said metering section being at least 4.5:1, and the length of said transition section being at least the sum of the lengths of said feed and metering sections;

rotating said screw to feed said mixture therealong from said feed section;

applying external heat to said mixture in said transition section at a temperature less than 385° F. to melt said mixture before it reaches said metering section;

thoroughly mixing said melt during the passage thereof through said transition section;

applying external heat to said melt in said metering section at a temperature less than 385° F. and at least equal to the temperature of said melt; and

extruding said melt at a controlled temperature less than 385° F. into a plurality of solution dyed filaments;

the relative dimensions of said transition section effecting efficient mixing of the melt therein while substantially eliminating the occurrence of an adiabatic condition therein with higher throughput rates of extrusion at low temperature.

4,347,208

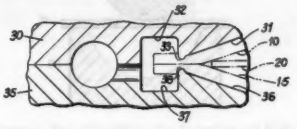
METHOD OF MAKING FILTER CELL HAVING SEALED PERIPHERY

Kenneth Southall, Wethersfield, Conn., assignor to AMF Incorporated, White Plains, N.Y.

Filed Apr. 13, 1981, Ser. No. 253,345

Int. Cl.³ B29C *6/04*

U.S. Cl. 264—229 **11 Claims**



1. A method of making a filter cell comprising two cellulosic fiber containing filter media, the filter cell having a sealed periphery, comprising:

(a) compressing peripheries of each media to form a flange at the periphery of each media;

(b) aligning the two media to provide intimate face-to-face contact between the flanges;

(c) providing spacer means between the media with a profile which causes each of the filter media within its flange to dish outwardly from the other media when the flanges are brought into intimate face-to face contact;

(d) placing the two media with the spacer means therebetween into a mold which surrounds the flanges, the mold having a means for providing a recompressing force to the inner portions of the flanges; and

(e) injecting into the mold a thermoplastic polymer to form a seal around the two flanges,

wherein the recompression force is sufficient to maintain the flanges in intimate face-to-face contact with each other and to prevent seepage of the polymer between the flanges when the polymer is injected into the mold.

4,347,209

METHOD FOR MOLDING ELONGATED PARISONS

Sadao Suzuki, Tokyo, Japan, assignor to Yoshino Kogyosho Co., Ltd., Japan

Continuation of Ser. No. 58,777, Jul. 19, 1979, abandoned. This application Dec. 1, 1980, Ser. No. 211,855

Int. Cl.³ B29D *3/00*

U.S. Cl. 264—250 **2 Claims**

1. A method for injection molding an elongated, closed bottom polymer parison to be blow molded into a final biaxially-stretched shape; comprising the steps of injection molding an open bottom parison by introducing molten polymer into a tubular mold cavity defined by a first set of a core and a mold unit having an end of the core thereof extending into said mold unit, such that at least a portion of said core is capable of eccentric movement within said mold unit so as to cause non-uniform wall thickness of said parison when not firmly retained from movement within said mold unit, an end portion of said end extending into and retained in an opening in said mold unit so as to prevent eccentric movement of said core within said

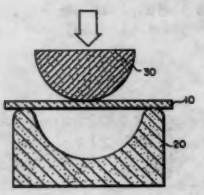
mold unit, and thereafter injection molding a bottom wall integrally with said open bottom parison to form said closed bottom parison by introducing molten polymer into a second mold cavity defined by a second set of a core and a mold unit and the open bottom of said open bottom parison clamped between said second set core and mold unit, whereby the closed bottom parison has substantially uniformly thin walls.

4,347,210

METHOD OF FORGING SPINEL DOMES

Edward A. Maguire, Ashland, and Richard L. Gentilman, Acton, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed May 9, 1980, Ser. No. 148,427
Int. Cl.³ B29D *11/00*
U.S. Cl. 264—294 **15 Claims**



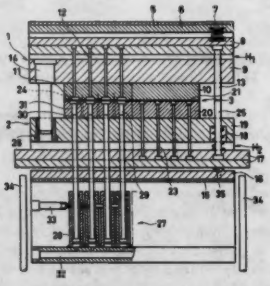
1. A method of comprising the steps of:
placing a plate of spinel between two portion of a mold, said two portions having complementary shapes for forming a cavity of a predetermined complex shape;
the composition of said spinel comprising a ratio of Al_2O_3:-MgO in the range of greater than 1:1 to 3.5:1;
heating said spinel to a temperature in the range below its melting point and above its single phase transition point; and
applying a pressure to said mold for producing compound stresses in said spinel plate to plastically deform said spinel plate to the complex shape of the mold cavity.

4,347,211

PROCESS AND APPARATUS FOR MOLDING PLASTICS

Kazuo Bandoh, No. 81-8, Toyama, Momoyama-cho, Fushimi-ku, Kyoto-shi, Japan

Filed Aug. 25, 1980, Ser. No. 180,932
Claims priority, application Japan, Aug. 24, 1979, 54/108424
Int. Cl.³ B29G *3/00*
U.S. Cl. 264—297 **5 Claims**



1. In a method of simultaneously molding a plurality of plastic articles in a mold having a plurality of cavities, the improvement wherein said mold comprises a plurality of bores, each bore forming a pot located adjacent a respective mold cavity, each pot being adapted to hold plastics material for injecting directly into said mold cavity by means of a plunger moveable in said pot, said mold being free of runners and gates, and wherein said method comprises injecting the plastics material directly into each cavity from said pot located adjacent its respective cavity, said pot being directly opened to and communicating with said cavity, such that the plastics material is injected directly thereinto without passing through a runner or a gate.

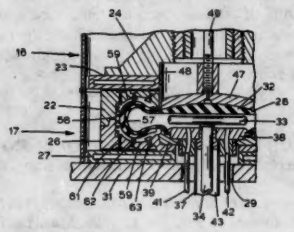
2. In a molding apparatus including an upper mold and a lower mold having molding surfaces having mating depressions therein forming a plurality of molding cavities, and means for injecting a plastics molding material into said cavities; the improvement wherein said injecting means comprises a plurality of plungers, each plunger being associated with one of said cavities and moveable in a bore, said bore at one end being directly opened to and communicating with said cavity, said open end of each bore serving as a separate pot for each cavity from which pot plastics material is directly injectable into its adjacent cavity without passing through a gate, said apparatus being free of a main runner, auxiliary runners, cull portion, and gates.

4,347,212

METHOD FOR FORMING A TIRE

Russell W. Carter, Des Moines, Iowa, assignor to Corn States Metal Fabricators, Inc., West Des Moines, Iowa

Filed Aug. 26, 1980, Ser. No. 181,461
Int. Cl.³ B29H *5/02*
U.S. Cl. 264—315 **2 Claims**



1. The method for forming a tire wherein shaping pressure and heat are applied to a preformed expandable tire band that is centered within a closed tire cavity and that has an outer surface expandable against the inner surface of the side wall of the tire cavity, comprising the steps of:
(a) continuously, without any intermediate stop, expanding the tire band from an initial non-distended condition to a final expanded condition in full conforming engagement with the inner surface of the tire cavity side wall to thereby continuously force all air from the space about the tire band to the atmosphere through air passages in the tire cavity side wall, the air passages having terminal ends in said inner surface thereof,
(b) closing said terminal ends by moving a yieldable valve section to a passage closing position within the terminal end of each passage concurrently with the continuous expanding of the outer surface of the tire band into full conforming engagement with the inner surface of the cavity side wall,
(c) forming said valve section with an end face that is smooth and continuous with the inner surface of the cavity side wall when the valve section is in a passage closing position therefor,
(d) yieldably maintaining each said valve section in an open position away from said inner surface until moved by the outer surface of the continuously expanding tire band to said passage closing position therefor, upon said full conforming engagement, and

(e) releasing the expanding pressure on the final expanded tire band and removing the formed tire from the tire cavity whereby each said yieldable valve section moves to the position therefor away from the inner surface to open said terminal ends of the air passages.

4,347,213

METHOD OF FORMING CONTOURED CUSHION

John E. Rogers, Jr., 700 N. Valley St., Anaheim, Calif. 92801

Filed Mar. 28, 1980, Ser. No. 134,981
Int. Cl.³ B29D 9/04
U.S. Cl. 264—510 **13 Claims**

1. A method of making a contoured cushion removably disposed on a recess defining support, said cushion contours conforming to the shape of the portion of a person's body resting on said cushion, comprising:

a. providing a pliable closed bag that is substantially filled with a plurality of particles that tend to flow relative to one another when subjected to pressure;

b. disposing said bag in said recess defining support;

c. positioning said person on said bag when the latter is disposed in said recess defining support and subsequently causing said person to move relative to said recess defining support, with the weight of said person causing said particles in said bag to flow relative to one another for a first portion of said bag in contact with said body of said person to conform to the contour thereof, and a second portion of said bag in said recess defining support to assume the shape thereof;

d. applying a partial vacuum to the interior of said bag to hold the same in the configuration to which it has been deformed by the weight of said person being supported thereon;

e. removing said person from said bag;

f. removing said bag from said recess defining support while maintaining said partial vacuum on the interior of said bag;

g. applying a fluid solidifiable material to the exterior of said bag while maintaining said partial vacuum thereon to substantially envelop said bag, said material being of a type that solidifies upon standing for a period of time and said material after solidifying providing a shell that tends to hold said bag in the shape to which it has been deformed;

h. releasing said partial vacuum after said material has solidified; and

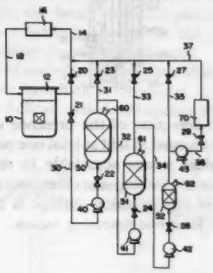
i. disposing said bag on said recess defining support to serve as said cushion for said person to rest thereon, and said cushion conforming to the contour of the portion of the body of said person in contact therewith.

4,347,214

FAILED FUEL DETECTION AND LOCATION APPARATUS

Hajime Sato, Kawasaki; Tetsuo Morisue, Yokohama, and Hideaki Heki, Kanagawa, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 15, 1980, Ser. No. 140,609
Claims priority, application Japan, Apr. 23, 1979, 54-49107; Apr. 23, 1979, 54-49108; Apr. 23, 1979, 54-49110
Int. Cl.³ G21C 17/00
U.S. Cl. 376—251 **8 Claims**



1. An apparatus for detecting the location of failed fuel by analyzing tag gas consisting of rare gas released in cover gas from the failed fuel, said rare gas being at least one from the group consisting of Xenon and Krypton, comprising:

(a) tag gas collection/enrichment means including at least two activated-charcoal adsorption columns for collecting tag gas from cover gas at an ambient temperature and for enriching said collected tag gas to an analyzable concentration, said columns being connected and being progressively smaller in volume in accordance with the increase in the degree of enrichment of the tag gas to an analyzable concentration;

(b) a line for introducing said cover gas containing tag gas into said tag gas collection/enrichment means;

(c) tag gas analysis means for analyzing said enriched tag gas to determine the composition thereof;

(d) a line for supplying said enriched tag gas to said analysis means; and

(e) a line for transmitting residual gas from which said collected gas is separated to a cover gas clean-up system.

4,347,215

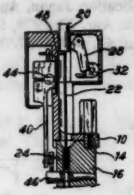
DEVICE FOR THE AUTOMATION OF AT LEAST ONE OPERATION IN AN INJECTOR FOR GAS CHROMATOGRAPHIC COLUMNS

Giorgio Sisti, Melzo; Bruno Tosi, Carate Brianza, both of Italy, and Sorin Trestianu, Brussels, Belgium, assignors to Carlo Erba Strumentazione S.p.A., Italy

Filed Jan. 2, 1981, Ser. No. 222,047
Claims priority, application Italy, Jan. 25, 1980, 19456 A/80
Int. Cl.³ G01N 1/14, 31/08
U.S. Cl. 422—63 **9 Claims**

1. A device for coordinating the position of an injection syringe needle in a gas chromatographic apparatus with at least one other operation of the gas chromatographic apparatus downstream of said device, said device comprising a first channel for introducing the injection syringe, said channel being substantially aligned with the injection channel of a gas chromatographic injector; at least one means for detecting the presence of the injection syringe at least at one point in said channel, wherein said detecting means comprises a position sensor and a lever rotatable around a lever axis substantially perpendicular to the axis of said first channel, wherein said lever has an arm and a shaped appendix, wherein said shaped

appendix protrudes into said channel when said lever is in its rest position, and wherein said appendix is positioned so that, when an injection syringe is introduced into said channel past said at least one point, the injection syringe contacts said appendix and causes rotation of said lever about said lever axis from said rest position so that said arm acts on said position



sensor to indicate detection of the presence of the injection syringe in the first channel at said at least one point; and at least one servomechanical means actuatable in response to said detecting means for controlling said other operation depending on whether or not the injection syringe is detected in the channel by said at least one detecting means.

4,347,216

WET SAMPLE DECOMPOSING APPARATUS

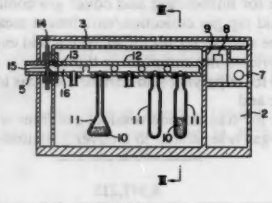
Kazuyoshi Kawasaki, and Yasumitsu Katsuno, both of Kitakyushu, Japan, assignors to Mitsubishi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 25, 1981, Ser. No. 277,197

Claims priority, application Japan, Jun. 30, 1980, 55-88923; Sep. 12, 1980, 55-126777

Int. Cl.³ G01N *31/12*; H05B *6/64*

U.S. Cl. 422—78 13 Claims



1. A sample decomposing apparatus comprising;

a microwave heating container forming a chamber and having on one side thereof a transparent door that intercepts microwaves and a wall having a perforation formed therethrough;

a microwave controller for controlling microwaves radiated in said chamber;

a plurality of sample decomposing containers;

means defining a hollow gas collector having a first gas discharge opening and a plurality of inlet opening means therein for removably mounting and affixing to said collector means each of said plurality of sample decomposing containers each containing a sample to be decomposed to generate said first gas, said hollow gas collector being disposed in said microwave heating container;

means for introducing a second gas into the hollow gas collector from the exterior thereof; and

external suction means for removing said first and second gases from said gas collector through said perforation in the wall of said heating container.

4,347,217

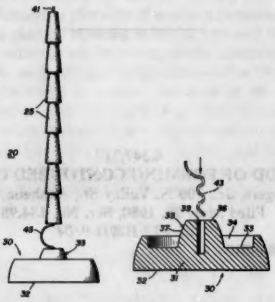
INCENSE HOLDER

Andrew P. Radkins, Bartlett; David P. Macarus, Downers Grove; James A. Radkins, Chicago, and Jay S. Waxman, Skokie, all of Ill., assignors to Genieco Inc., Chicago, Ill.

Filed May 19, 1980, Ser. No. 151,202

Int. Cl.³ A61L *9/03*

U.S. Cl. 422—126 9 Claims



1. A carrier for incense beads having holes therethrough, said carrier comprising a rod adapted to extend through the holes of one or more associated incense beads, an axially elongated mounting portion at one end of said rod having a lateral extent greater than the thickness of said rod, and a laterally-offset stop portion adjacent to said mounting portion shaped and dimensioned to prevent the passage of associated incense beads therealong thereby to maintain a predetermined space between the associated incense beads and said mounting portion.

5. An incense holder for incense beads having holes therethrough, said holder comprising a body having a bottom wall adapted to rest upon an associated underlying support surface, an upstanding projection extending upwardly from said bottom wall centrally thereof and projecting well above the remainder of said body, and an elongated mounting bore extending downwardly through said projection centrally thereof, an elongated rod having a diameter substantially less than the diameter of said mounting bore and adapted to extend through the holes of one or more associated incense beads, an axially elongated mounting portion at one end of said rod having a lateral extent greater than the thickness of said rod and shaped and dimensioned to be received in a substantially stable upright orientation in said mounting bore, and a laterally-offset stop portion adjacent to said mounting portion shaped and dimensioned to prevent the passage of incense beads therealong and to limit the depth of insertion of said mounting portion in said mounting bore thereby to maintain a predetermined space between the incense beads and said body.

4,347,218

APPARATUS FOR MAKING CARBON BLACK

Oskar Posch, Biberist, Switzerland, assignor to Anstalt Mura, Vaduz, Liechtenstein

Division of Ser. No. 936,764, Aug. 25, 1978, Pat. No. 4,246,232. This application May 27, 1980, Ser. No. 153,253

Claims priority, application Switzerland, Sep. 2, 1977, 10759/77

Int. Cl.³ C09C *1/00*

U.S. Cl. 422—151 3 Claims

1. Apparatus for production of carbon black, the apparatus being of a type having:

a reactor including a reaction chamber for carbon black formation and an overall cover;

a plurality of unjacketed feed units mounted to said overall cover, each equipped for separately supplying air to said

reaction chamber from an air supply apparatus and spraying hydrocarbon material into the air near a discharge end of the feed unit;

a heat exchanger provided on the discharge side of said reactor for reducing the temperature of the reactor output gases and the carbon black produced therein; and

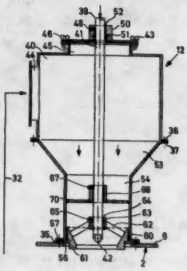
a means on the discharge side of said heat exchanger for delivering the carbon black from the reactor,

each of said units comprising:

an input air chamber section having an air supply inlet and being open at its output end, and further comprising a coverable opening and a demountable cover therefor opposite its output end;

an output guide section having an open input end mounted to the open output end of said input air chamber and tapering down to a cylindrical portion narrower than said input air chamber;

a hydrocarbon supply pipe extending through said air input chamber and through said output guide section and isolating air in said input air chamber from hydrocarbon material;



a spray nozzle mounted to said supply pipe for spraying hydrocarbon material into air passing through said narrower cylindrical portion of said output guide section;

a vortex member having restricting flow openings and demountably affixed to said supply pipe within said narrower cylindrical portion of said output guide section; and

an air output restricting nozzle demountably affixed to said supply pipe and removably mounted to said output guide section adjacent the output of said output guide section;

said supply pipe, spray nozzle, vortex member and output restricting nozzle being connected together with said cover as an interconnected unit, and being proportioned to feed reagent air and hydrocarbon for production of a particular grade of carbon black in said apparatus, and said interconnected unit being removable from the feed unit through said coverable opening of said input air chamber to permit easy demounting of said vortex member, said air output restricting nozzle and said spray nozzle from said supply pipes.

4,347,219

CATALYTIC CONVERTER FOR EXHAUST-GAS CLEANING USE AND METHOD OF ASSEMBLING SAME

Yutaka Noritake, Kawagoe; Ikuo Kajitani, Hanno; Sakuji Arai, Ageo, and Toshiaki Muto, Kamifukuoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1980, Ser. No. 220,145

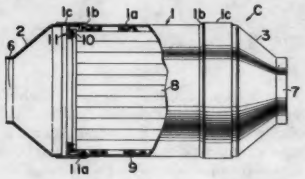
Claims priority, application Japan, Dec. 29, 1979, 54-172154; Dec. 29, 1979, 54-182816[U]

Int. Cl.³ F01N *3/28*

U.S. Cl. 422—180 **8 Claims**

1. In a catalytic converter for exhaust-gas cleaning use in which a monolithic catalyst substrate is supported in a hollow cylindrical casing body by a tubular cushioning element of wire-mesh form and held axially in place by a pair of annular holding fixtures secured to the casing body and each fitted with an end cushioning element for engagement with the adjacent end face of the catalyst substrate, the improvement wherein said casing body comprises an integral cylinder having a smaller-diameter cylindrical portion and a larger-diameter cylindrical portion connected to at least one end of said smaller-diameter cylindrical portion through the medium of a sloped shoulder portion and wherein said tubular cushioning element extends into said larger-diameter cylindrical portion whereby when the monolithic catalyst substrate and the tubular cushioning element surrounding the same are inserted into the casing body, the larger-diameter portion and the sloped shoulder portion gradually compress the tubular cushioning element to facilitate the insertion thereof.

8. A method of assembling a catalytic converter for exhaust-gas cleaning use in which a monolithic catalyst substrate is supported in a hollow cylindrical casing body by cushioning



means, said method comprising the steps of: forming said casing body with an enlarged-diameter portion at least at one end thereof which is connected with the central straight cylindrical portion of the casing body through the intermediary of a sloped shoulder portion; fitting over said enlarged-diameter portion an insertion jig defining an outwardly divergent flaring insertion opening therein the smallest diameter of which is larger than the inside diameter of the central straight cylindrical portion of the casing body; inserting said catalyst substrate as covered around the periphery thereof with a tubular cushioning element through said insertion opening of said insertion jig into the enlarged-diameter portion of said casing body while subjecting said cushioning element to a primary radial compression; and inserting said catalyst substrate further into said casing body over said sloped shoulder portion while subjecting said cushioning element to a secondary radial compression until said catalyst substrate is held in a predetermined position within said casing body.

4,347,220

SYSTEM FOR DRYING AND BURNING VISCOUS AQUEOUS LIQUORS WHICH CONTAIN ORGANICS

Hugh W. Nelson, West Hartford; George J. Prohazka, Simsbury, both of Conn., and Keith W. Morris, Ashton, Canada, assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jun. 27, 1980, Ser. No. 163,836

Int. Cl.³ D21C *11/04*

U.S. Cl. 422—185 **1 Claim**

1. A system for producing smelt from black liquor, including,

means connected to a source of heavy black liquor for supplying heavy black liquor containing both organic and inorganic solids,

means connected to a source of sawdust for supplying sawdust in the form of solid particles which are finely-divided and porous and combustible,

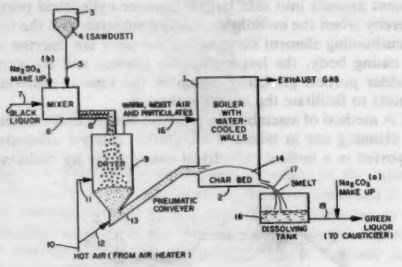
a mixer connected to the means for supplying the black liquor and the means for supplying sawdust particles to intimately contact the liquor and sawdust particles to coat the sawdust particles with the solids of the black liquor,

a drying vessel connected to the mixer to receive the mixture,

means for supplying dry heated air,

a first conduit connecting the means for supplying the dry heated air to the drying vessel to introduce dry heated air into the dryer to vaporize the water from the solids of the black liquor and leave the solids as a dry coat on the sawdust particles,

a boiler having water-cooled walls and a hearth on which organic material is burned to generate heat with which to convert the boiler water into steam,



a second conduit connecting the dryer to the boiler to transport the heated moist air from the dryer into the furnace of the boiler above the hearth as combustion air,

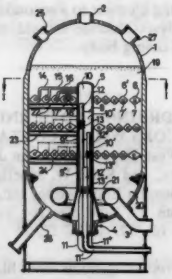
a third conduit connecting the dryer to the boiler to transport the sawdust particles with their coat of solid material to the hearth of the boiler furnace where the solid material forms a bed in which the organic solids burn and the inorganic solids smelt, a dissolving tank containing water, and a means for flowing the smelt from the boiler into a body of water in the dissolving tank to form green liquor.

4,347,221

CATALYTIC CONVERTER

Jun Zamma; Isao Makino, both of Chiba; Toshiyuki Mii, Funabashi, and Kazumi Shima, Chiba, all of Japan, assignors to Toyo Engineering Corporation, Japan

Filed Mar. 2, 1981, Ser. No. 239,614
Claims priority, application Japan, Mar. 13, 1980, 55-3092
Int. Cl.³ F28D *21/00*
U.S. Cl. 422—207 **16 Claims**



1. A catalytic converter which comprises:

a converter shell having a make-up gas inlet port, a product gas outlet port, an opening and a plurality of gas supply conduits through which a part of the make-up gas is adapted to be fed for controlling the reaction temperature, said gas supply conduits being positioned in said opening in said shell;

a single catalyst bed disposed in said converter shell;

a hollow gas supply chamber disposed within said catalyst bed, said gas supply chamber being closed at one end thereof and in communication at the other end thereof with said opening for receiving said gas supply conduits therein;

at least one stage of gas injection means comprising a plurality of gas injection rings which are disposed within said catalyst bed, said gas injection rings incorporating gas sparging means;

a plurality of beams which extend between and are secured to the inner surface of said converter shell and the outer surface of said gas supply chamber and which support said gas injection rings in said at least one stage, each of said beams being secured at one end to a point on said inner wall of said converter shell and at the other end to a point opposite thereto on said outer wall of said gas supply chamber;

at least one small chamber formed within said gas supply chamber, the number of said small chambers being equal to the number of the stages of said gas injection means;

elongated connecting means for interconnecting each of said small chambers to each of said gas supply conduits, said connecting means being installed inside said gas supply chamber; and

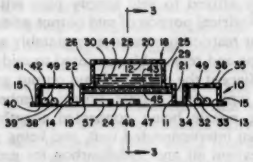
connecting tubes for interconnecting each of said small chambers to each stage of said gas injection means.

4,347,222

GAS GENERATING APPARATUS FOR ANAEROBIC ATMOSPHERE

Glenn L. Beall, Gurnee, and Robert P. Noonan, Naperville, both of Ill., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Apr. 21, 1981, Ser. No. 257,512
Int. Cl.³ B01J *8/00*
U.S. Cl. 422—211 **7 Claims**



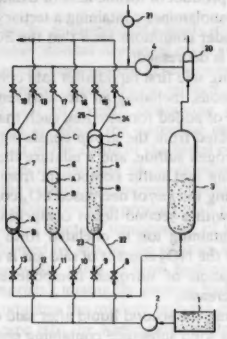
1. Apparatus for generating an anaerobic atmosphere which comprises in combination a first receptacle having upper and lower transversely positioned openings, a second receptacle closed at one end and having an opposite end communicating with the upper opening of said first receptacle, said second receptacle containing a liquid and having the upper opening between said second receptacle and said first receptacle sealed in a gas and liquid-tight manner with a first rupturable film, said first receptacle containing a composition capable of producing a reducing gas upon contact thereof with the liquid from said second receptacle, said first receptacle also containing an absorbent material located along and covering the first rupturable film at the upper opening thereof, said lower opening of said first receptacle being sealed in a gas and liquid-tight manner with a second rupturable film, a separate third receptacle located adjacent to said first receptacle, said third receptacle containing a catalyst capable of catalyzing the reaction between the reducing gas and oxygen, said third receptacle also having an opening enabling the catalyst to communicate with the surrounding atmosphere.

4,347,223

APPARATUS FOR MAKING SUPPLY OF HIGH PRESSURE LIQUID AND RELIEF OF PRESSURE OF THE SAME

Yoji Kitaoka, Ichihara; Mizuho Hirato, Hitachi, and Kazuo Miyatani, Tokyo, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Oct. 2, 1980, Ser. No. 193,079
Claims priority, application Japan, Oct. 18, 1979, 54-133599
Int. Cl.³ B01J *3/02, 8/00;* F04F *11/02*
U.S. Cl. 422—242 1 Claim



1. Apparatus for use in high-pressure liquefaction reaction processes of the type in which a material slurry is supplied under a high pressure into a high-pressure liquefaction reaction vessel through utilization of the pressure possessed by a high-pressure product slurry from the high-pressure liquefaction reaction vessel and, at the same time, a product slurry is put for a pressure relief and taken out as a low-pressure product, which comprises:

a high-pressure liquefaction reaction vessel;

at least one cylinder having a float therein;

a low-pressure slurry pump for supplying under a low pressure a material slurry into said cylinder;

a material slurry introduction pipe having a valve and connecting between said low-pressure slurry pump and a lower end of said cylinder;

a material slurry discharge pipe for guiding under a high pressure a material slurry from said cylinder to said high-pressure liquefaction reaction vessel, said material slurry discharge pipe having a valve and connecting between a lower end portion of said cylinder and the high-pressure liquefaction reaction vessel;

a product slurry introduction pipe for guiding under a high pressure a product slurry from said high-pressure liquefaction reaction vessel to said cylinder, said product slurry introduction pipe being connected to an upper end portion of said cylinder through said high-pressure liquefaction reaction vessel, a gas separator for separating gas out of the product slurry, a pump operative to compensate for a pressure loss due to the reaction and a valve; and

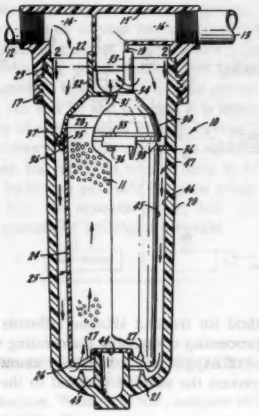
a product slurry discharge pipe for recovering under a low pressure a product slurry from an upper end portion of said cylinder, said product slurry discharge pipe including a valve and being adapted to release the pressure of the high pressure product slurry introduced into said cylinder and recover the pressure released product slurry upon the introduction of the material slurry into the lower end of said cylinder by said low-pressure slurry pump.

4,347,224

CHEMICAL DISPENSER

Adolf F. Beckert, Woodbury; Dennis G. Winberg, Cottage Grove, and Duane D. Nowlin, New Brighton, all of Minn., assignors to Ecodyne Corporation, Lincolnshire, Ill.

Filed May 30, 1980, Ser. No. 154,646
Int. Cl.³ B01F *1/00, 3/12*
U.S. Cl. 422—277 8 Claims



1. Apparatus for dissolving a solid chemical into a pressurized liquid flowing through a conduit, comprising;

(a) a fixed housing having a liquid inlet opening and a liquid outlet opening connected to said conduit, a downwardly facing opening below said liquid inlet and outlet openings, downwardly facing tubular means in said downwardly facing opening, and said tubular means being connected to said outlet opening;

(b) a removable housing havings a closed end and an open end, said open end being removably connected to said downwardly facing opening of said fixed housing; and

(c) a removable cartridge containing a supply of said solid chemical, means for centering and holding said cartridge in said removable housing below said tubular means in said fixed housing, the outside surface of said cartridge being spaced from and facing the inside surface of said removable housing, there being a liquid inlet hole in said cartridge, a relatively small liquid outlet hole at the top of said cartridge, a tubular extension protruding upwardly from the upper end of said cartridge around said liquid outlet hole, said extension being coupled with said tubular means in said fixed housing, there being a relatively large aperture through said extension;

whereby all of said liquid flowing through said conduit enters said removable housing, a minor amount of such liquid in said removable housing flowing between said facing surfaces and into said liquid inlet hole of said cartridge, said minor amount of liquid flowing through said solid chemical in said cartridge and dissolving same and then out said liquid outlet hole into said tubular extension, the remainder of said liquid in said removable housing flowing through said aperture into said extension where it is mixed with the dissolved chemical and then enters said tubular means and exits through said outlet opening.

4,347,225

METHOD FOR TREATING ALKALINE EFFLUENTS RESULTING FROM PETROLEUM PROCESSING

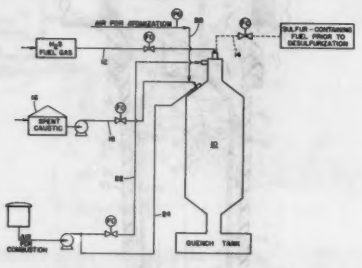
Costandi A. Audeh, Princeton, and Saverio G. Greco, Princeton Junction, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 26, 1981, Ser. No. 238,309

The portion of the term of this patent subsequent to Aug. 31, 1999, has been disclaimed.

Int. Cl.³ C01D *5/00*

U.S. Cl. 423—207 9 Claims



1. A method for treating alkaline effluents resulting from petroleum processing comprising incinerating said effluents in the presence of oxygen and a sufficient amount of hydrogen sulfide to convert the alkaline material to the corresponding sulfate.

4,347,226

METHOD FOR TREATING SULFUR-CONTAINING EFFLUENTS RESULTING FROM PETROLEUM PROCESSING

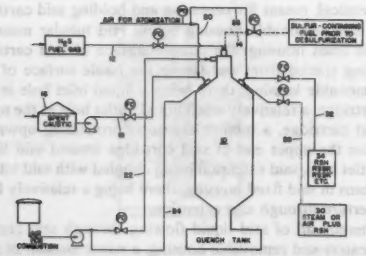
Costandi A. Audeh, Princeton, and Saverio G. Greco, Princeton Junction, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 3, 1981, Ser. No. 239,922

The portion of the term of this patent subsequent to Aug. 31, 1999, has been disclaimed.

Int. Cl.³ C01D *5/00*

U.S. Cl. 423—207 7 Claims



1. A process for disposal of noxious waste products generated in petroleum refining including spent caustic solution and concentrated sulfur effluent from treating of petroleum fractions to remove sulfur therefrom comprising incinerating said spent caustic solution and said concentrated sulfur effluent together in the presence of air so that the sulfur contained in said concentrated sulfur effluent is converted to the oxides of sulfur which react with the incinerated caustic to form alkali metal sulfates.

4,347,227

PROCESS FOR REMOVING SO_x AND NO_x COMPOUNDS FROM GAS STREAMS

Robert H. Hass, Fullerton, and Walter Albertson, Brea, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 242,611, Mar. 11, 1981. This application Jul. 14, 1981, Ser. No. 283,183

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—235 41 Claims

1. A process for treating a feed gas comprising NO_x and SO_x components, which process comprises:

(1) contacting said feed gas with a first liquid comprising the reaction product of formic acid or oxalic acid with one or more alkanolamines containing a tertiary amine functional group under conditions such that the SO_x content of said feed gas is decreased;

(2) subjecting said first liquid after said contacting in step (1) to conditions, including an elevated temperature and the presence of added formate ion, such that a sulfur component selected from the group consisting of elemental sulfur, hydrogen sulfide, and a mixture thereof forms;

(3) separating said sulfur component from said first liquid;

(4) contacting the gas of decreased SO_x content produced in step (1) with a second liquid comprising a NO_x-reactive metal-containing ion in chelated form under conditions such that the NO_x content of said gas is decreased and the concentration of nitrogen components in said second liquid increases;

(5) contacting the second liquid after said contacting in step (4) with a solid substance containing one or more tertiary amine functional groups under conditions, including an elevated temperature and pressure and the presence of added formate ion, such that the concentration of nitrogen components in said second liquid decreases; and

(6) withdrawing a product gas from step (4) of reduced SO_x and NO_x content in comparison to the feed gas.

4,347,228

PROCESS FOR DEFLUORINATION OF PHOSPHORIC ACID

Friedrich Wolstein, Essen, and Gerhard Koch, Marklohe, both of Fed. Rep. of Germany, assignors to Uhde GmbH and Kali Chemie AG, both of Dortmund, Fed. Rep. of Germany

Filed Feb. 23, 1981, Ser. No. 236,657

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1980, 3009622

Int. Cl.³ C01B *25/16*

U.S. Cl. 423—321 R 3 Claims

1. In a process for the defluorination of phosphoric acid by a method which includes a heating step conducted in the presence of an additive present in the acid, and comprising silica, to accomplish both concentration and removal of fluorine, the improvement wherein the additive consists essentially of active porous silica gel having a specific surface of 130 to 600 m^2/g and having a mean pore volume of 0.3 to 1.5 m 1/g.

4,347,229

PROCESS FOR THE PYROGENIC PRODUCTION OF FINELY DIVIDED OXIDE OF A METAL AND/OR A METALLOID

Josef Schmid, Rheinfelden; Ludwig Lange, Bruhl; Hans Klebe, and Dieter Schutte, both of Rheinfelden, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 3, 1980, Ser. No. 156,082

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1979, 2923182

The portion of the term of this patent subsequent to Mar. 24, 1998, has been disclaimed.

Int. Cl.[3] C01B *33/113;* C01F *7/02;* C01G *23/047, 17/02*

U.S. Cl. 423—336 9 Claims

1. In a process for the production of a finely divided oxide of a metal or metalloid or mixture of a metal oxide and a metalloid oxide employing as starting materials (1) a vaporizable halogen compound of the metal, metalloid or mixture of metal and metalloidal halide, (2) an oxygen containing gas and (3) a combustible gas and in which the elemental halogen formed during the formation of the oxide of the metal or metalloid or mixture thereof from the burning of the combustible gas and the hydrolysis of the vaporizable halogen compound is reacted during the cooling of the reaction product with gaseous hydrogen introduced below reaction temperature of the oxyhydrogen gas mixture formed by mixing the gaseous hydrogen with oxygen containing waste gases to form hydrogen halide, the improvement comprising mixing the gaseous hydrogen with an inert gas and introducing the mixture into the cooling section through a single pipe into the waste gases containing halogen while the reaction product is cooled in the cooling section.

4,347,230

PROCESS FOR THE PREPARATION OF ALPHA MERCURIC IODIDE MONOCRYSTALS

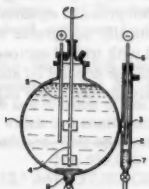
Ion F. Nicolau, Seyssins, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 23, 1980, Ser. No. 161,923

Claims priority, application France, Jun. 26, 1979, 79 16418

Int. Cl.[3] C30B *29/12*

U.S. Cl. 423—491 13 Claims



ELECTROLYTIC PURIFICATION

1. A process for the growth of alpha mercuric iodide monocrystals in solution, comprising the steps of preparing an alpha mercuric iodide solution in an organic sulphoxide and causing growth on a nucleus located in a cavity able to block the growth defects of the monocrystal, the nucleus resting by one face on the bottom of a prismatic cavity having a rectangular cross-section made in a nucleus carrier in the direction of the nucleus.

4,347,231

PREPARATION OF HYDROGEN PEROXIDE FROM ITS ELEMENTS

Robert C. Michaelson, Waldwick, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Jun. 17, 1981, Ser. No. 274,575

Int. Cl.[3] C01B *15/02*

U.S. Cl. 423—584 11 Claims

1. In a process for producing hydrogen peroxide by the catalyzed reaction of hydrogen and oxygen, the improvement which comprises contacting gaseous hydrogen and oxygen with a two phase homogeneous catalysis system, which contains (i) an inert organic solvent having dissolved therein an iridium complex homogeneous catalyst and a quinone-derivative reaction promoter, which catalyst has the formula $IrCl(CO)(XR_3)_2$ wherein X is selected from the group of elements consisting of P, As, and Sb and wherein R is selected from the group consisting of phenyl, alkyl radicals having 2 to 6 carbon atoms, and cyclohexyl radicals, and (ii) an aqueous solution as the second phase, for sufficient time to form hydrogen peroxide; extracting hydrogen peroxide reaction product from the organic phase into the aqueous phase; and recovering the aqueous phase containing hydrogen peroxide.

4,347,232

PREPARATION OF HYDROGEN PEROXIDE FROM ITS ELEMENTS

Robert C. Michaelson, Waldwick, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Jun. 17, 1981, Ser. No. 274,597

Int. Cl.[3] C01B *15/02*

U.S. Cl. 423—584 8 Claims

1. In a process for producing hydrogen peroxide by the catalyzed reaction of hydrogen and oxygen, the improvement which comprises contacting gaseous hydrogen and oxygen with a two phase homogeneous catalysis system, which contains (i) an inert organic solvent phase having dissolved therein as the homogeneous catalyst a palladium(O) complex of dibenzylidene acetone and (ii) an aqueous solution as the second phase, for sufficient time to form hydrogen peroxide; extracting hydrogen peroxide reaction product from the organic phase into the aqueous phase; and recovering the aqueous phase containing hydrogen peroxide.

4,347,233

DENTAL CARIES DETECTION

Junichi Yamauchi; Kyoichiro Shibatani; Eiji Ikeguchi; Ikuo Omura, and Yoshinori Nagase, all of Kurashiki, Japan, assignors to Kuraray Company, Limited, Kurashiki, Japan

Filed Nov. 29, 1979, Ser. No. 98,686

Claims priority, application Japan, Dec. 4, 1978, 53-150410

Int. Cl.[3] A61K *6/00, 49/00;* G01N *1/30, 21/25*

U.S. Cl. 424—7 3 Claims

1. A method for distinguishing, by observation with visible light, between the carious portion and the sound portion of a decaying tooth by selectively dyeing the carious portion, which comprises applying a solution of Acid Red (CI 45100) in a concentration of from 0.1 to 5.0% by weight in a solvent which comprises at least 60% by weight of a mono-, di- or tri-hydroxy compound containing 2 to 20 carbon atoms to a decayed tooth to selectively dye the carious portion of the tooth, and then within 10 seconds after applying the solution washing away the remaining solution before the sound portion of the tooth is dyed with said solution.

4,347,234

MEDICINALLY USEFUL, SHAPED MASS OF COLLAGEN RESORBABLE IN THE BODY

Helmut Wahlig, Darmstadt; Elvira Dingeldain, Dreieich, and Dietrich Braun, Darmstadt-Arheilgen, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Division of Ser. No. 82,520, Oct. 9, 1979, Pat. No. 4,291,013.
This application Jun. 15, 1981, Ser. No. 273,291
Claims priority, application Fed. Rep. of Germany, Jan. 9, 1978, 2843963
Int. Cl.[3] A61K *9/22, 9/26;* A61F *13/00;* A61L *15/03*
U.S. Cl. 424—15 6 Claims

1. A collagen based drug delivery system which is resorbable in the body, is sterilized and has been compacted into the shape of a tablet, spheroid, foil, pipe, plate, fiber, granule, strand or tube implantable into the body, by the application of heat of a temperature of 40°–200° C., optionally also with application of pressure of 300–1200 bar, with extrusion, with injection molding or with sintering and which, upon administration to the body, essentially maintains its shape and effects a retarded liberation of the drug, comprising 0.2–20 weight percent of a pharmacologically active drug material, 1–25 weight percent of a bioresorbable binding agent for collagen, and the balance being finely ground collagen, the binding agent consisting essentially of a co- or homopolymer of natural amino acids or of hydrolyzed collagen or hydrolyzed elastin.

4,347,235

WATER-SOLUBLE TABLET

Louis G. Daunora, Lakewood, Colo., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Sep. 3, 1981, Ser. No. 299,122
Int. Cl.[3] A61K *2/46, 9/20, 31/765*
U.S. Cl. 424—44 8 Claims

1. In a water-soluble tablet comprising one or more active ingredients, additives and one or more lubricants, the improvement wherein sodium propionate is present.

4,347,236

PROCESS FOR THE PREPARATION OF A MIXTURE OF AN ANTI-INFLAMMATORY STEROID AND A FLUORO-CHLORO-HYDROCARBON TO BE USED AS A PROPELLANT

Paavo T. Tanskanen, Kuopio, Finland, assignor to Orion-yhtymä Oy, Finland

Filed May 19, 1981, Ser. No. 265,333
Claims priority, application Finland, May 19, 1980, 801610
Int. Cl.[3] A61L *9/04;* A61K *31/56*
U.S. Cl. 424—45 17 Claims

1. A process for preparing a stable aerosol formulation of beclomethasone dipropionate in a fluoro-chlorohydrocarbon propellant wherein the beclomethasone dipropionate has a particle size smaller than 5 μm, said process comprising suspending beclomethasone dipropionate, ground into a particle size smaller than 5 μm, in a small quantity of a fluoro-chlorohydrocarbon propellant at a temperature of from about −40° to +5° C., stirring the resultant mixture for at least 24 hours at a temperature of from about −40° to +5° C. in the course of which time the mixture is brought to the stabilization stage, and adding to the stabilized mixture during or after said stirring a further quantity of the propellant sufficient to make an aerosol formulation suitable for use in inhalation therapy, whereby increase in the particle size of the beclomethasone dipropionate is substantially prevented throughout said process and during subsequent storage.

4,347,237

LOWER FATTY ACID GLYCERIDE HIGH-HLB LUBRICATING SUPPOSITORY AND METHOD FOR MAKING AND USING THE SAME

Kenneth L. Evenstad, 16235 Holdridge Rd., Wayzata, Minn. 55391, and Hiep Nguyen, 18605 33rd Ave. North, Plymouth, Minn. 55447

Filed Mar. 2, 1981, Ser. No. 239,882
Int. Cl.[3] A61K *9/02*
U.S. Cl. 424—78 12 Claims

1. A lubricating suppository for the human vaginal canal, which suppository is solid at normal ambient temperatures but melts at human body temperature to form a substantially homogeneous liquid having the appearance of a single liquid phase, said suppository comprising:

(a) a continuous phase comprising a water soluble polyoxyalkylene polyol component consisting essentially of polyoxyethylene glycol having a molecular weight within the range of 400 to 5000, said component being formulated to have a melting range low enough to ensure the formation of a clear molten liquid at less than about 75° C.;

(b) about 10–60 parts per one hundred parts by weight of said polyoxyalkylene polyol component, of a nonionic surfactant having an HLB value greater than 12, said nonionic surfactant being uniformly distributed through said continuous phase;

(c) about 10–40 parts per hundred, based on the weight of said polyoxyalkylene polyol component, of a C_6–C_{12} aliphatic carboxylic acid glyceride said glyceride being uniformly distributed throughout said continuous phase with the aid of said nonionic surfactant;

said lubricating suppository, in either the solid or molten state, having sufficient compatibility with water to be readily uniformly distributable in water.

4,347,238

AUTOCLAVABLE EMULSION CONTAINING SILVER SULPHADIAZINE

Derek A. Hollingsbee, Chelmsford, England, assignor to Smith & Nephew Associated Companies Limited, England

Filed Oct. 24, 1980, Ser. No. 200,429
Claims priority, application United Kingdom, Oct. 26, 1979, 7937183
Int. Cl.[3] A61K *31/78, 31/00, 47/00, 31/555*
U.S. Cl. 424—81 6 Claims

1. A heat sterilized, mobile, drop-forming, ophthalmic oil-in-water emulsion which comprises an aqueous solution of 0.04 to 0.25% of a pharmaceutically acceptable salt of polyacrylic acid lightly cross-linked with triallyl sucrose, a pharmacologically acceptable vegetable or mineral oil and a therapeutically effective amount of finely divided silver sulphadiazine.

4,347,239

INACTIVATED RABIES VACCINE FOR VETERINARY USE

Edmund P. Bass, and Richard L. Sharpee, both of Lincoln, Nebr., assignors to Norden Laboratories, Inc., Lincoln, Nebr.

Filed Jul. 30, 1980, Ser. No. 174,306
Int. Cl.[3] A61K *39/205*
U.S. Cl. 424—89 11 Claims

1. An inactivated rabies virus vaccine capable of inducing immunity in feline animals without serious side effects comprising a vaccinal amount of inactivated HCP-SAD strain of rabies virus which has been adapted, before inactivation, to grow in swine testicle cell cultures, an adjuvant and a carrier therefor.

4,347,240

ANTITUMOR AGENT CONTAINING *LACTOBACILLUS CASEI* YIT 9018

Masahiko Mutai, Higashi Yamato; Teruo Yokokura, Tokyo; Seizaburo Kobayashi, and Ikuo Kato, both of Hachioji, all of Japan, assignors to Kabushiki Kaisha Yakult Honsha, Tokyo, Japan

Filed Feb. 26, 1980, Ser. No. 124,725
Claims priority, application Japan, Feb. 27, 1979, 54-21339
Int. Cl.³ A61K *39/02*
U.S. Cl. 424—92 8 Claims

1. A composition for inhibiting tumor growth, which comprises a tumor growth-inhibiting amount of whole cells of *Lactobacillus casei* YIT 9018 and a physiologically acceptable saline carrier.

4,347,241

DELAYED RELEASE COATED METAL PHOSPHIDE PESTICIDES

Wolfgang Kapp, Offenbach am Main, Fed. Rep. of Germany, assignor to Degesch GmbH, Frankfurt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 716,701, Aug. 19, 1976, abandoned. This application Mar. 1, 1978, Ser. No. 882,949
Claims priority, application South Africa, Sep. 2, 1975, 75/5587
Int. Cl.³ A01N *55/00, 59/26*
U.S. Cl. 424—128 7 Claims

1. A composition for pest control by fumigation including a metal phosphide, selected from the group consisting of aluminum phosphide, magnesium phosphide and calcium phosphide, dry-coated with a composition composed of urea, which urea has first been rendered water-repellent by treatment in a non-polar organic solvent with a water-repellent poly(methyl hydrogen)siloxane substance in the presence of air and an organometallic catalyst of a noble transition metal of Group VIII of the Periodic Table, or of tin, said coating composition also including a substance which is chemically or physically modifiable or decomposable to cause apertures to be formed in the coating under predetermined conditions for access of water or water vapor to the phosphide particles, said modifiable or decomposable substance being selected from the group consisting of ammonium carbamate, ammonium carbonate, sodium bicarbonate, ammonium bicarbonate, ammonium cyanide and potassium bicarbonate.

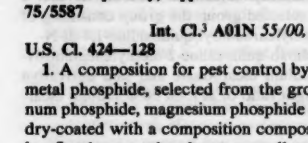
4,347,242

HYPOCALCAEMIC PEPTIDES AND PROCESS FOR THEIR MANUFACTURE

Robert Neher, Binningen, and Bernhard Riniker, Frenkendorf, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 632,928, Nov. 18, 1975, abandoned, which is a continuation of Ser. No. 488,880, Jul. 15, 1974, abandoned, which is a division of Ser. No. 253,077, May 15, 1972, abandoned, which is a continuation of Ser. No. 831,776, Jun. 9, 1969, abandoned. This application Mar. 22, 1978, Ser. No. 889,066
Int. Cl.³ A61K *37/00;* C07C *103/52*
U.S. Cl. 424—177 2 Claims

1. The dotriacontapeptide amide of the formula



its acid addition salts and complexes.

4,347,243

ACID SOLUBLE, PEPSIN RESISTANT PLATELET AGGREGATING MATERIAL

Morris D. Schneider, Knoxville, Tenn., assignor to Research Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 81,974, Oct. 4, 1979, abandoned, which is a continuation of Ser. No. 875,730, Feb. 7, 1978, abandoned. This application Aug. 12, 1981, Ser. No. 292,200
Int. Cl.³ A61K *37/02, 37/12;* C12P *21/06;* C12N *9/00;* C07G *7/00*
U.S. Cl. 424—177 15 Claims

1. A method of preparing a hemostatic agent comprising the steps of:

(a) extracting cleansed, homogenized equine arterial tissue with dilute aqueous acid at from about 0° C. to 5° C.,
(b) dialyzing the extract against dilute acid,
(c) subjecting the retentate to proteolysis with pepsin, and
(d) precipitating the hemostatic agent by the addition of a water soluble salt to the resulting mixture.

7. An acid soluble, pepsin resistant, non-dialyzable, proteinaceous hemostatic agent isolated from equine arterial tissue characterized by the ability to enhance platelet aggregating activity in mammalian blood, stable for extended periods of time at temperatures as low as −85° C., losing its platelet aggregating activity when exposed to collagenase at 37° C. or when heated at 100° C. for fifteen minutes; containing the following average number of amino acid residues per 1,000 total amino acid residues:

Lysine	23.8	Glycine	254.2
Histidine	10.4	Alanine	100.1
Hydroxylysine	5.5	Cysteine	10.7
Hydroxyproline	42.4	Valine	44.0
Aspartic Acid	75.1	Methionine	6.6
Threonine	36.0	Isoleucine	31.9
Serine	52.8	Leucine	52.1
Glutamic Acid	94.3	Tryosine	15.2
Proline	87.1	Phenylalanine	25.9
	Arginine 33.9;		

which on SDS-PAGE electrophoresis products bands characteristic of the following molecular weights:

322,000
300,000
250,000
220,000
163,000
132,000
116,000
100,000
61,500
51,500
45,000
36,000

4,347,244

GANGLIOSIDE CONTAINING COMPOSITIONS FOR TREATING DIARRHEA

Marie-Claude Mynard, Sainte Foy-les-Lyon, and Jean-Louis Tayot, La Tour de Salvagny, both of France, assignors to Societe Anonyme dite: Institut Merieux, Lyons, France

PCT No. PCT/FR80/00037, § 371 Date Nov. 13, 1980, § 102(e) Date Nov. 13, 1980, PCT Pub. No. WO80/01875, PCT Pub. Date Sep. 18, 1980
PCT Filed Mar. 17, 1980, Ser. No. 217,114
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1979, 2910509; France, Mar. 16, 1979, 79 06732
Int. Cl.³ A61K *31/70*
U.S. Cl. 424—180 23 Claims

1. A medicament for the treatment of acute diarrhea comprising an orally administrable medium having fixed thereon an effective amount of a ganglioside or ganglioside derivative

having an affinity for the toxins produced by bacteria responsible for diarrhea, said medium having a strong affinity for the ganglioside or which can be chemically linked to the said ganglioside or ganglioside derivative, said medium further having a high specific surface, and allowing satisfactory contact between the ganglioside and the toxin to be neutralized.

4,347,245

SPIRONOLACTONE-CONTAINING COMPOSITION AND USE THEREOF

German Shapiro, 938 Eudora St., Denver, Colo. 80220

Filed May 26, 1981, Ser. No. 266,924
Int. Cl.³ A61K *31/58*
U.S. Cl. 424—241 **10 Claims**

1. A composition for effectively suppressing excess androgenic activity which occurs at a skin site so as to effectively treat hirsuitisum, said composition being directly applied to said skin site, the composition consisting essentially of:

a liquid carrier selected from the group consisting of alcohol, urea, mineral oil and white petrolatum; and

spironolactone in an amount of from about 0.25 wt% to about 5.0 wt% which effectively suppresses excess androgenic activity at said skin site.

6. In a process for treating at least one skin site characterized by excess androgenic activity so as to effectively suppress said excess androgenic activity, the improvement comprising: directly applying a spironolactone-containing composition to said at least one skin site, said composition consisting essentially of a liquid carrier selected from the group consisting of alcohol, urea, mineral oil and white petroleum and spironolactone in an amount of from about 0.25 wt% to about 5.0 wt% which effectively suppresses androgenic activity at said skin site.

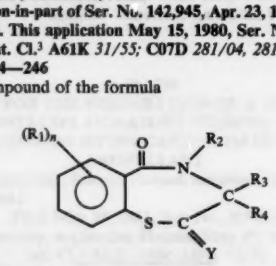
4,347,246

ANTIHYPERTENSIVE LACTAMS

John T. Suh, Greenwich, Conn.; Bruce E. Williams, Cottage Grove, Minn.; Jerry W. Skiles, Tuckahoe, and Bernard Loev, Scarsdale, both of N.Y., assignors to USV Pharmaceutical Corporation, Tuckahoe, N.Y.

Continuation-in-part of Ser. No. 142,945, Apr. 23, 1980, Pat. No. 4,287,203. This application May 15, 1980, Ser. No. 263,824
Int. Cl.³ A61K *31/55*; C07D *281/04, 281/18*
U.S. Cl. 424—246 **9 Claims**

1. A compound of the formula



wherein

R_1 is independently C_1–C_{20} alkyl, C_2–C_{20} alkenyl, C_2–C_{20} alkynyl, hydroxy, C_1–C_{10} alkoxy, hydroxy C_1–C_{20} alkyl, thio, thio C_1–C_{20} alkyl, C_1–C_{20} amino, amino C_1–C_{20} alkyl, C_1–C_{20} alkylamino, nitro, cyano, C_1–C_{20} alkanoyl, carboxy, carboxy C_1–C_{20} alkyl, carb C_1–C_{10} alkoxy, carb C_1–C_{10} alkoxy, carb C_1–C_{10} alkoxy C_1–C_{20} alkyl, C_1–C_{20} alkylsulfoxy, C_1–C_{20} alkylsulfonyl, sulfonyl, sulfonamido, halogen, trifluoromethyl, or methylenedioxy,

n is an integer from 1 to 4 inclusive,

R_2, R_3 and R_4 are independently hydrogen, C_1–C_{20} alkyl, C_2–C_{20} alkenyl, C_2–C_{20} alkynyl, C_3–C_{16} cycloalkyl, phenyl, tolyl, benzyl, phenyethyl, dimethoxyphenol, hydroxybenzyl, indanyl, naphthyl, tetrahydronaphthyl, decahydronaphthyl, pyridyl, quinolyn, pyrrolidyl, pyrrolyl, morpholinyl, furyl, furfuryl, tetrahydrofurfuryl, benzimidazolyl, thiomorpholinyl, thienyl, imidazolyl, or tetrahydroindolyl, and Y is $=O$, $=S$, $=NR_1$, $=NOR_1$, or $=N—NH_2$, R_1 being the same as defined above.

9. A process for treating hypertension which comprises administering to the hypertensive animal an effective amount of a compound according to claim 1.

4,347,247

PHARMACOLOGICAL PREPARATION COMPOSED OF A QUINOXALINE DERIVATIVE MIXED WITH SODIUM BICARBONATE

Vincenzo Giobbio, Turin, and Livio Buracchi, Ivrea, both of Italy, assignors to Pierrel S.p.A., Milan, Italy

Filed May 1, 1980, Ser. No. 145,811
Claims priority, application Italy, May 7, 1979, 67949 A/79
Int. Cl.³ A61K *31/495*
U.S. Cl. 424—250 **3 Claims**

1. A pharmaceutical composition for use in animal husbandry, consisting essentially of sodium bicarbonate and a quinoxaline derivative selected group the group consisting of 2-methyl-3(β-hydroxyethylcarbamoyl)quinoxaline-1,4-di-N-oxide and N_1,N_4-dioxo-quinoxaline-2-methyleneimino-N-methylurethane, the sodium bicarbonate and said derivative being admixed in a weight ratio of at least 50% sodium bicarbonate.

4,347,248

2,3-DISUBSTITUTED-THIAZOLO[3,2-a]PYRIMIDINES

William B. Wright, Jr., Woodcliff Lake; Andrew S. Tomcufcik, Old Tappan, both of N.J., and Joseph W. Marsico, Jr., Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 23, 1981, Ser. No. 246,347
Int. Cl.³ C07D *513/04*; A61K *31/38*
U.S. Cl. 424—251 **7 Claims**

1. A compound selected from the group consisting of 2-(p-fluorophenyl)-3-(p-fluorobenzyl)-6,7-dihydro-5H-thiazolo[3,2-a]pyrimidine and the pharmacologically acceptable acid-addition salts thereof.

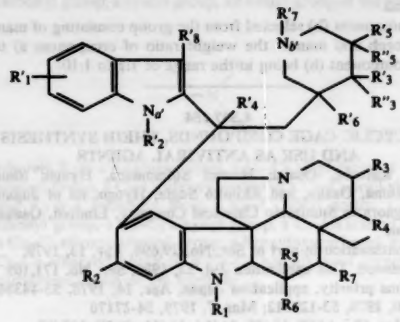
4,347,249

CLASS OF SECO BIS-INDOLIC COMPOUNDS WHICH CAN BE USED AS DRUGS AND A PROCESS FOR THE PREPARATION THEREOF

Pierre Potier, Bois d'Arcy; Nicole Langlois; Yves Langlois, both of Bures-sur-Yvette; Ratremaniaina Z. Andriamialisoa, Les Ulis, and Pierre Mangeney, Paris, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), France

Filed Jul. 9, 1980, Ser. No. 167,377
Claims priority, application France, Jul. 17, 1979, 79 18453
Int. Cl.³ A61K *31/475*; C07D *519/04*
U.S. Cl. 424—262 **18 Claims**

1. Compounds corresponding to the general formula:



(I)

in which

R'_1 is selected from a hydrogen atom, formyl, and alkoxy, acyl, and halogenoacyl radicals of 1 to 5 carbon atoms,

R'_2 is selected from a hydrogen atom and alkyl radicals of 1 to 5 carbon atoms,

R'_3 and R''_3 are each independently selected from a hydrogen atom and hydroxyl and alkanoyloxy radicals of 1 to 5 carbon atoms, or R'_3 and R''_3 together form a carbonyl group, or R'_3 and R'_5 together form an epoxy bridge or a double bond,

R'_4 is selected from a hydrogen atom and alkyloxycarbonyl in which the alkyl portion has from 1 to 5 carbon atoms, hydroxymethyl, alkanoyloxymethyl radicals in which the alkanoyloxy portion has from 1 to 5 carbon atoms and acetamido radicals,

R'_5 and R''_5 are each independently selected from a hydrogen atom and hydroxyl, alkanoyloxy radicals of 1 to 5 carbon atoms, ethyl and 2-hydroxyethyl radicals,

R'_6 is selected from a hydrogen atom and ethyl, 2-hydroxyethyl and acetyl radicals,

R'_7 and R'_8 are each independently selected from a hydrogen atom and methyl, hydroxymethylene, alkoxymethylene in which the alkoxy group has 1 to 5 carbon atoms, aryloxymethylene in which the aryl group is monocyclic with 5 or 6 atoms in the ring, aminomethylene, monoalkyl and dialkyl aminomethylene in which the alkyl groups have from 1 to 5 carbon atoms, arylaminomethylene in which the aryl group is monocyclic with 5 or 6 atoms in the ring, hydroxyethyl aminomethylene, alkyl thiomethylene in which the alkyl group has from 1 to 5 carbon atoms, aryl thiomethylene in which the aryl group is monocyclic and has 5 or 6 atoms in the ring, cyanomethylene and acylmethylene radicals in which the acyl portion has from 1 to 5 carbon atoms,

R_1 is selected from a hydrogen atom and alkyl, formyl and acyl radicals in which the alkyl and acyl radicals have from 1 to 5 carbon atoms,

R_2 is selected from a hydrogen atom and alkoxy radicals having from 1 to 5 carbon atoms,

R_3 is selected from a hydrogen atom and hydroxyl and alkanoyloxy radicals of 1 to 5 carbon atoms, or R_3 and R_4 together form an epoxy bridge or a double bond,

R_4 is selected from a hydrogen atom and hydroxyl and alkanoyloxy radicals of 1 to 5 carbon atoms or R_4 and R_5 together form an epoxy bridge,

R_6 is selected from alkyloxycarbonyl in which the alkyl portion has from 1 to 5 carbon atoms, hydrazido, acetamido, hydroxymethyl and alkanoyloxymethylene radicals in which the alkanoyloxy portion has 1 to 5 carbon atoms,

R_5 and R_7 are selected from a hydrogen atom and hydroxide and alkanoyloxy radicals of 1 to 5 carbon atoms,

as well as their pharmaceutically acceptable acid addition salts and their pharmaceutically acceptable quaternary ammonium salts.

17. A pharmaceutical composition for treating leukemia comprising an effective amount of at least one compound according to any one of claim 1 to 3 as active ingredient.

18. A method of treating leukemia comprising administering an effective amount of a compound according to claim 1.

4,347,250

PYRIDYL ALKYLTHIOUREA AND ALKYLAMINO-NITROETHYLENE

Graham J. Durant; Charon R. Ganellin, both of Welwyn Garden City; Geoffrey R. Owen, High Wycombe, and Rodney C. Young, Bengeo, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

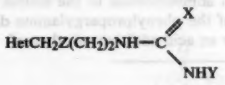
Division of Ser. No. 35,152, May 2, 1979, Pat. No. 4,247,558, which is a division of Ser. No. 892,231, Mar. 31, 1978, Pat. No. 4,166,856, which is a division of Ser. No. 686,185, May 13, 1976, Pat. No. 4,098,898. This application Sep. 2, 1980, Ser. No. 183,555

Claims priority, application United Kingdom, May 21, 1975, 21817/75; Nov. 20, 1975, 47782/75

Int. Cl.³ C07D *213/64, 213/75;* **A61K** *31/44*

U.S. Cl. 424—263 **7 Claims**

1. A compound of the formula:



wherein X is sulphur or $CHNO_2$; Y is amino, lower alkylamino, di(lower alkyl)amino, lower alkoxy, phenylethyl, allyl, 2,2,2-trifluoroethyl, or $(CH_2)_nR$; Z is sulphur or methylene; Het is a pyridine ring which ring is optionally substituted by lower alkyl, hydroxy, halogen or amino; n is an integer from 1 to 12; and R is hydroxy or lower alkoxy; provided that when X is sulphur, Y is not phenylethyl or a pharmaceutically acceptable acid addition salt thereof.

7. A method of blocking histamine H_2-receptors which comprises administering to an animal in need thereof in an effective amount to block said receptors a compound of claim 1.

4,347,251

NOVEL 3-SUBSTITUTED AMINO-1-SUBSTITUTED HETEROARYL-2-PYRAZOLINES

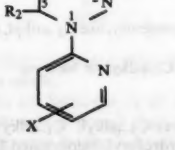
Joseph P. Joseph, Montvale, N.J.; John P. Dusza, Nanuet, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 13, 1981, Ser. No. 282,827

Int. Cl.³ A61K *31/44;* **C07D** *401/04*

U.S. Cl. 424—263 **8 Claims**

1. A compound selected from the group consisting of those of the formula:



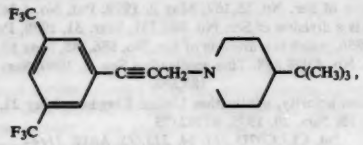
wherein R_1 and R_2 may be hydrogen or lower alkyl (C_1–C_4); R_3 is -$COCH_3$ or -CHO; X is halo or trifluoromethyl or a pharmacologically acceptable acid-addition salt thereof.

4,347,252
RODENTICIDAL 1-(3,5-BISTRIFLUOROMETHYLPHENYL)-3-(4-T-BUTYL-PIPERIDINO)PROP-1-YNE

Allan P. Leftwick, Ilford, and Edgar W. Parnell, Hornchurch, both of England, assignors to May & Baker Ltd., Essex, England

Filed May 1*, 1981, Ser. No. 262,521
Claims priority, application United Kingdom, May 13, 1980, 8015740
Int. Cl.³ A61K *31/445;* C07D *211/14*
U.S. Cl. 424—267 14 Claims

1. 1-(3,5-Bistrifluoromethylphenyl)-3-(4-tert-butyl-piperidino)prop-1-yne of the formula:



or an acid addition salt thereof.

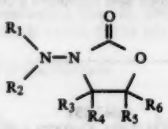
4. A method for killing undesired warm-blooded vermin which comprises the oral administration to the animal of an effective lethal amount of the phenylpropargylamine derivative claimed in claim 1 or an acid addition salt thereof.

4,347,253
FUNGICIDES

Jost Harr, Oberwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

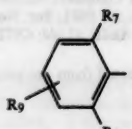
Filed Aug. 15, 1980, Ser. No. 178,276
Claims priority, application United Kingdom, Apr. 25, 1980, 8013719; Apr. 25, 1980, 8013720; Apr. 25, 1980, 8013721
Int. Cl.³ A01N *43/36, 43/76, 47/10, 59/20*
U.S. Cl. 424—272 12 Claims

1. A fungicidal composition comprising a component a) of formula I



I

wherein
R_1 is



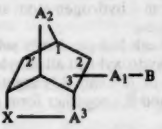
wherein
R_7 and R_8, independently, are C_{1-4}alkyl, halogen or C_{1-4}alkoxy, and
R_9 is hydrogen, C_{1-4}alkyl or halogen,
R_2 is CO–R_{10},
wherein
R_{10} is C_{1-4}alkoxy-C_{1-4}alkyl, C_{1-4}alkyl-thio-C_{1-4}alkyl, 2-furyl, 2-tetrahydrofuryl, halogenated 2-furyl, halogenated 2-tetrahydrofuryl, 1-imidazolymethyl, 1-pyrrazolylmethyl, 2-tetrahydrofuryloxymethyl, 2-tetrahydropyranyloxymethyl, C_{1-4}halogenalkyl, and
R_3, R_4, R_5 and R_6 are independently hydrogen or C_{1-4}alkyl, and
a component (b) selected from the group consisting of mancozeb and maneb; the weight ratio of component a) to component (b) being in the range of 1:1 to 1:10.

4,347,254
TRICYCLIC CAGE COMPOUNDS, THEIR SYNTHESIS AND USE AS ANTIVIRAL AGENTS

Junki Katsube, Osaka; Hiromi Shimomura, Hyogo; Shun Inokuma, Osaka, and Akihiko Sugie, Hyogo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 29,694, Apr. 13, 1979, abandoned. This application Jul. 22, 1980, Ser. No. 171,109
Claims priority, application Japan, Apr. 14, 1978, 53-44386; Oct. 20, 1978, 53-129812; Mar. 7, 1979, 54-27170
Int. Cl.³ A61K *31/38, 31/34, 31/35;* C07D *307/92*
U.S. Cl. 424—275 20 Claims

1. A compound of the formula:

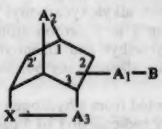


wherein A_1 is a single bond or a C_1–C_5 alkylene group bonding at the 2- , 2'- or 3-position, A_2 is a C_1–C_3 alkylene group, A_3 is a C_1–C_4 alkylene group, X is —O— or —SO_n—, wherein n is an integer of 0 to 2 and B is a cyano group; an amino group of the formula:

wherein R_1 is a hydrogen atom, a C_1–C_5 alkyl group, a C_3–C_5 alkenyl group, a C_3–C_5 alkynyl group or a C_7–C_9 aralkyl group and R_2 is a hydrogen atom, a C_1–C_5 alkyl group, a C_3–C_5 alkenyl group, a C_3–C_5 alkynyl group, a C_7–C_9 aralkyl group, a C_2–C_5 alkoxycarbonyl group, a benzyloxycarbonyl group, a C_2–C_5 alkanoyl group or a C_2–C_4 haloalkanoyl group; or a carbamoyl group of the formula:

wherein R_3 and R_4 are each a hydrogen atom, a C_1–C_5 alkyl group or a C_3–C_5 alkenyl group, or non-toxic salts thereof.

13. A method for inhibiting the growth of virus in mammals which comprises administering orally or parenterally to said mammals an effective antiviral amount of at least one compound of the formula:



wherein A_1 is a single bond or a C_1–C_5 alkylene group bonding at the 2- , 2'- or 3-position, A_2 is a C_1–C_3 alkylene group, A_3 is a C_1–C_4 alkylene group, X is —O— or —SO_n—, wherein n is

an integer of 0 to 2 and B is a carboxy group; a C_2–C_5 alkoxycarbonyl group; a cyano group; an amino group of the formula:

wherein R_1 is a hydrogen atom, a C_1–C_5 alkyl group, a C_3–C_5 alkenyl group, a C_3–C_5 alkynyl group or a C_7–C_9 aralkyl group and R_2 is a hydrogen atom, a C_1–C_5 alkyl group, a C_3–C_5 alkenyl group, a C_3–C_5 alkynyl group, a C_7–C_9 aralkyl group, a C_2–C_5 alkoxycarbonyl group, a benzyloxycarbonyl group, a C_2–C_5 alkanoyl group or a C_2–C_4 haloalkanoyl group; or a carbamoyl group of the formula:

wherein R_3 and R_4 are each a hydrogen atom, a C_1–C_5 alkyl group or a C_3–C_5 alkenyl group, or non-toxic salts thereof; and a pharmaceutically acceptable carrier or diluent.

4,347,255

SNAKE BITE THERAPY

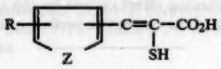
Eugene L. Giroux, Cincinnati, Ohio, assignor to Richardson-Merrell Inc., Wilton, Conn.

Continuation of Ser. No. 140,446, Apr. 17, 1980, abandoned. This application Aug. 7, 1981, Ser. No. 290,906

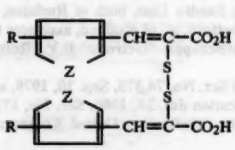
Int. Cl.³ A61K *31/34, 31/38, 31/40*

U.S. Cl. 424—285 **6 Claims**

1. A method of reducing local hemorrhage and tissue necrosis in mammals resulting from the bite or sting of a venomous snake which comprises administering to said mammal a local hemorrhage and tissue necrosis reducing amount of a compound having the formula:



or a corresponding disulfide of the formula:



wherein Z is 0 and R is selected from the group consisting of H, methyl, ethyl, hydroxy, methoxy, ethoxy, fluoro, chloro, bromo, iodo and trifluoromethyl; or a pharmaceutically acceptable salt thereof.

4,347,256

ANTI-JUVENILE HORMONES

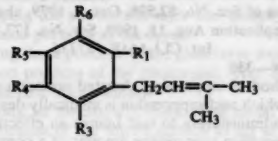
William S. Bowers, Geneva, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Mar. 2, 1981, Ser. No. 239,745

Int. Cl.³ A01N *37/02, 31/08, 31/14*

U.S. Cl. 424—311 **13 Claims**

1. A method of treating an insect to inhibit the juvenile hormone activity in said insect and thereby effect insect control which comprises contacting an insect with a juvenile-hormone inhibiting amount of an active anti-juvenile hormone corresponding to the formula:

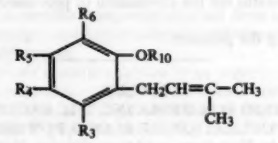


where R_1 and R_5 are independently hydrogen; straight or branch chain lower alkyl or alkenyl having 1–4 carbon atoms;

where R_2 is straight or branch chain lower alkyl having 1–6 carbon atoms; —X—R_7 where X is O or S and R_7 is hydrogen, or straight or branch chain lower alkyl lower alkenyl or lower alkynyl containing 1–4 carbon atoms; provided that at least one of R_1 and R_5 is —X—R_7 or

and where R_3, R_4 and R_6 are hydrogen or straight or branch chain lower alkyl, alkenyl, alkoxy, or alkenoxy having 1–4 carbon atoms or R_3 and R_4 taken together are

4. The method as in claim 1 of treating an insect to inhibit the juvenile hormone activity in said insect and thereby effect insect control which comprises contacting an insect with an active anti-juvenile hormone corresponding to



where R_{10} is hydrogen, straight or branch chain alkyl or alkenyl containing 1–4 carbon atoms,

where R_2 is straight or branch chain lower alkyl containing 1–6 carbon atoms;

where R_4 and R_5 are hydrogen or an organic substituent selected from straight or branch chain lower alkyl, alkoxy alkenoxy or alkynoxy having 1–4 carbon atoms, and

where R_3 and R_6 are hydrogen or straight or branch chain lower alkyl, alkenyl, alkoxy, alkenoxy or alkynoxy having 1–4 carbon atoms.

4,347,257

PROLACTIN SUPPRESSION IN MAMMALS

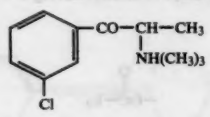
Warren C. Stern, Raleigh, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 82,598, Oct. 9, 1979, abandoned. This application Aug. 11, 1980, Ser. No. 177,128

Int. Cl.³ A61K *31/135*

U.S. Cl. 424—330 21 Claims

1. A method of suppressing elevated prolactin secretion in a human in which said suppression is medically desirable, which comprises administering to said human an effective non-toxic prolactin secretion suppression amount of a compound of the formula (I)



(I)

or a pharmaceutically acceptable acid addition salt thereof.

4,347,258

PROCESS FOR THE PREPARATION OF A STABLE FOOD PRODUCT FROM LACTEAL COMPONENTS

Karl Merkenich, Rimbach; Wilhelm Koch, Ladenburg; Kaete Glandorf; Gerd Uhlmann, both of Mannheim, and Guenther Scheurer, Hassloch, all of Fed. Rep. of Germany, assignors to Benckiser-Knapsack GmbH, Ladenburg, Fed. Rep. of Germany

Filed Apr. 18, 1980, Ser. No. 141,672

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1979, 2917086

Int. Cl.³ A23C *20/00, 23/00;* A23D *3/02*

U.S. Cl. 426—334 14 Claims

1. A process for the preparation of a stable food product from milk components, comprising the steps of:

mixing from about 20–40% by weight skim milk powder, from about 0–45% by weight butter fat, and from about 30–80% by weight water with from about 2–6% by weight, based upon the weight of skim milk and butter fat, of a mixture of salts comprising monosodium phosphate, sodium polyphosphate having about 70% P_2O_5 and a cross-linked polyphosphate having a pH value of 2.9, in a proportion of approximately 3:4:2;

heating the resulting mixture to a temperature of from about 50°–120° C., within about 2–20 minutes under agitation in an apparatus for the production of processed cheese; and then

recovering the product.

4,347,259

METHOD FOR REDUCING THE BACTERIAL POPULATION OF BLOOD POWDER

Yoshio Suzuki, Kamakura, and Masao Shimizu, Yokohama, both of Japan, assignors to Niigata Engineering Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 77,809, Sep. 21, 1979, abandoned, which is a continuation of Ser. No. 925,338, Jul. 17, 1978, abandoned. This application Jan. 15, 1980, Ser. No. 112,254

Claims priority, application Japan, Jul. 16, 1977, 52/85388

Int. Cl.³ A23B *4/00*

U.S. Cl. 426—465 16 Claims

1. A method for reducing the bacterial population of a blood powder without substantially heat denaturing the blood protein in said powder or degrading the water solubility or heat coagulability of said blood protein during said method for reducing the bacterial population, which comprises heating said blood powder which has a moisture content of about 30% by weight or less at a temperature of about 80° to 160° C. for a period of time to reduce the bacterial population of said blood powder so as to obtain blood products having a solubility of at least 50%.

4,347,260

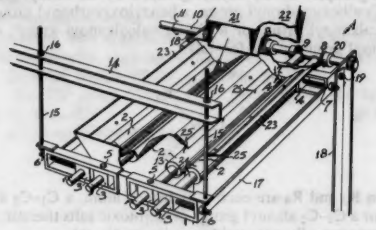
METHOD OF SEPARATING ALMOND KERNELS FROM ALMONDS WITH SHELLS

Alan W. Crompton, Marryatville, Australia, assignor to Alf Hannaford & Co. Pty. Limited, Beverley, Australia

Filed Jun. 27, 1980, Ser. No. 163,687

Int. Cl.³ A23N *5/00*

U.S. Cl. 426—483 3 Claims



1. A method of separating a mixture of almond kernels and almond kernels still retained within at least a part of their shells, the method comprises placing a mixture of said kernels with and without their shells onto two substantially parallel rollers having their axes inclined to the horizontal and having a separation gap therebetween sized to permit passage of almond kernels therethrough, each roller rotating about its longitudinal axis in a direction contra to the other roller such that its circumference rises past the separation gap and proceeds upwardly and outwardly with respect to the surface of the other roller, and moving a mixture of said kernels still with shells into said separation gap in a direction transverse to the direction of movement of each roller, thereby allowing almond kernels without their shells to drop through the said separation gap due to an aligning effect caused by the upward and outward movement of the respective surface of the roller.

4,347,261

PROCESS FOR PREPARATION OF ALGIN OR PECTIN GELS

Ian A. Challen; Sandra East, both of Rushden, and George R. Sanderson, Bedford, all of England, assignors to International Octrooi Maatischappit "Octropa" B.V., Rotterdam, Netherlands

Continuation of Ser. No. 74,375, Sep. 10, 1979, abandoned. This application Jul. 24, 1980, Ser. No. 171,674

Claims priority, application United Kingdom, Sep. 8, 1978, 36085/78

Int. Cl.³ A23L *1/04*

U.S. Cl. 426—573 8 Claims

1. In a process for producing an aqueous gel which comprises releasing a gelling agent into a gellable aqueous sol selected from the group consisting of aqueous alginate and low-methoxy-pectate sols, the improvement which comprises rapidly mixing throughout said sol an aqueous slurry of a finely divided foodstuff and calcium sulphate particles in an amount such that the calcium sulphate particles constitute 0.2 to 1% by weight of the total mix, and then under shear-free conditions allowing the calcium sulphate to release the calcium ions in solution so that the mixture is gelled, the said mixing being completed before gelation begins, the bulk volume ratio between the sol and the slurry being in the range 3:1 to 1:3, and the ratio of the volume of water in the sol to the water available in the slurry being greater than 1.5:1.

4,347,262
ALUMINUM-MAGNESIUM ALLOYS IN LOW RESISTANCE CONTACTS TO SILICON

Sanford M. Marcus, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 26, 1980, Ser. No. 210,553
Int. Cl.³ C23C *17/00*; H01L *23/48*
U.S. Cl. 427—74 **5 Claims**

1. A thick-film metallizing paste for use in providing low resistance electrically conductive contacts to a silicon solar cell coated with Si_3N_4, said paste comprising an organic vehicle containing, in particle form, a mixture of a major amount of a metal powder, a minor amount of finely divided glass frits, and a small amount of a 50 Al:50 Mg alloy.

4,347,263
METHOD OF APPLYING AN ANTIREFLECTIVE AND/OR DIELECTRIC COATING

Daniel L. Whitehouse, Clarksburg, Md., assignor to Solarex Corporation, Rockville, Md.

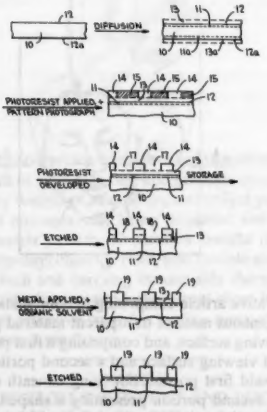
Continuation-in-part of Ser. No. 154,770, May 30, 1980, abandoned. This application Apr. 24, 1981, Ser. No. 257,250
Int. Cl.³ B05D *1/34*
U.S. Cl. 427—74 **10 Claims**

1. A method of applying an antireflective coating to the surface of a photovoltaic cell, said surface being adapted to absorb light impinging thereon, comprising heating said surface to a temperature above approximately 325° C., and directing to said surface from separate sources (a) a vapor comprising a metal compound selected from the group consisting of a metal halide or metal alkoxide, and (b) oxygen, so that an antireflective layer of the respective oxide is deposited on said surface.

4,347,264
METHOD OF APPLYING CONTACTS TO A SILICON WAFER AND PRODUCT FORMED THEREBY

Joseph Lindmayer, Bethesda, Md., assignor to Solarex Corporation, Rockville, Md.

Division of Ser. No. 614,618, Sep. 18, 1975, abandoned. This application Jun. 13, 1978, Ser. No. 915,288
Int. Cl.³ B05D *5/12*; F16L *55/10*; H01L *31/00*
U.S. Cl. 430—314 **2 Claims**



1. A method of forming a contact pattern on a silicon wafer to be used as a solar energy cell, comprising

(a) heating a wafer of silicon with a dffusant to for a p-n junction in a zone extending inwardly from a surface of the wafer and a layer of a glass on the surface of the wafer,

(b) coating the glass on the surface with a layer of photoresist composition,

(c) photographically exposing the photoresist layer in a predetermined pattern,

(d) developing the photoresist layer and thereby removing the exposed portions of the layer,

(e) removing those portions of the glass layer underlying the developed portions of the photoresist layer down to the silicon surface of the wafer,

(f) depositing an electrically conductive metal on the exposed portions of the silicon surface to act as contacts in the solar energy cell while the remainder of the wafer surface is protected and covered by undeveloped portions of the photoresist layer and portions of the glass layer underlying said undeveloped portions,

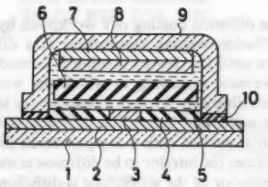
(g) removing the remainder of the photoresist layer, and

(h) removing the entirety of the glass from the surface of the wafer thereby leaving a metal contact adhered to said surface in a predetermined pattern, said surface and said metal contact being free of said glass, and exposing non-contact covered portions of said surface to ambient conditions only after said contact pattern has been adhered to said surface.

4,347,265
FORMATION OF AN ELECTROCHROMIC DISPLAY LAYER

Junichi Washo, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 13, 1980, Ser. No. 120,987
Claims priority, application Japan, Feb. 16, 1979, 54-17525
Int. Cl.³ G02F *1/17*
U.S. Cl. 427—108 **10 Claims**



1. A process of making an electrochromic layer comprising the steps of:

providing a metallic compound selected from one member of the group consisting of chlorides and ethers of tungsten and molybdenum;

dissolving said metallic chloride in an organic alcohol solvent therefor or said metallic ether in an aromic hydrocarbon solvent therefor so as to produce an organic solution;

applying said organic solution to the surface of a substrate; and

calcining said resulting coated substrate at a temperature of from 200° to 500° C. to produce said electrochromic layer.

4,347,266
PROTECTION AGAINST SOILING

Edward C. Norman, and Howard A. Dowell, both of Downingtown, Pa., assignors to Enterra Corporation, Lionville, Pa.

Filed Aug. 13, 1979, Ser. No. 66,022
Int. Cl.³ B65B *33/00*
U.S. Cl. 427—154 **9 Claims**

1. In the process of protecting the surface of a water-resistant article against soiling by spraying on that surface an aqueous surfactant-containing dispersion of a film former that forms a film which can be flushed off with water, and after exposure to the soiling flushing off that film along with any soil on it, the improvement according to which the surface protected is a

heavily waxed or shined hydrophobic surface and the aqueous dispersion contains not over 1% total surfactant but at least 0.02% fluorinated surfactant leveling agent that causes the sprayed-on aqueous dispersion to form a relatively level coating over essentially the entire surface.

4,347,267

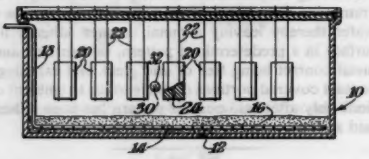
DIFFUSION COATING THROUGH RESTRICTIONS

Alfonso L. Baldi, Wynnewood, Pa., assignor to Alloy Surfaces Company, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 89,949, Oct. 31, 1979, abandoned. This application Feb. 2, 1981, Ser. No. 230,333

Int. Cl.³ B05D 7/22, 7/14; C23C 13/02

U.S. Cl. 427—237 18 Claims



1. In the diffusion coating of the internal surface of a hollow in a metal workpiece where that hollow is accessible only through a passageway less than about 5 millimeters wide, the improvement according to which there is applied over that internal surface an essentially uniform layer of particles consisting essentially of all the metal to be diffused into that surface, and the workpiece so treated is subjected to diffusion coating temperature while the hollow is exposed through the passageway to an energizer-containing diffusion coating atmosphere.

17. In the diffusion coating of a workpiece by holding it in a gaseous diffusion coating atmosphere at a diffusion coating temperature until the desired coating is formed on its surface, the improvement according to which the workpiece has an interior accessible only through a passageway less than about 5 millimeters wide, and before the diffusion coating treatment that interior is packed with a dry powdered diffusion coating pack that causes the interior to be diffusion coated by that pack while the exterior of the workpiece is diffusion coated by the diffusion coating atmosphere.

4,347,268

NOVEL FLUOROELASTOMER FILM COMPOSITIONS CONTAINING VINYL COPOLYMERS AND METHOD FOR THE PREPARATION THEREOF

Donald Close, Stow, Ohio, assignor to David Hudson, Inc., Stow, Ohio

Filed Aug. 18, 1980, Ser. No. 178,896

Int. Cl.³ C08L 27/16, 27/06, 31/04

U.S. Cl. 427—385.5 4 Claims

1. An improved method for preparing fluoroelastomer solutions which can be employed to coat various substrates comprising the steps of:

dissolving a fluoroelastomer gum selected from the group consisting of copolymers of vinylidene fluoride and hexafluoropropylene, and terpolymers of vinylidene fluoride, hexafluoropropylene and tetrafluoroethylene in a solvent; and

adding a vinyl copolymer selected from the group consisting of vinyl chloride-vinyl acetate copolymer resins, acid modified resins thereof and hydroxyl modified resins thereof to said gum solution;

the improvement wherein said fluoroelastomer gum and vinyl copolymer solution is devoid of metallic oxides in order to improve adhesion between coatings formed therefrom and various substrates.

4,347,269

METHOD OF AND APPARATUS FOR APPLYING A COATING TO A WEB OF SHEET MATERIAL

Geoffrey S. Keep, Henley-on-Thames, England, assignor to The Wiggins Teape Group Limited, Hampshire, England

Filed Apr. 2, 1981, Ser. No. 250,294

Claims priority, application United Kingdom, Apr. 8, 1980, 8011462

Int. Cl.³ B05D 1/28

U.S. Cl. 427—428 3 Claims

1. A method of applying a coating composition to a continuous web of sheet material, comprising the steps of applying a metered amount of coating composition by means of a gravure roll to a transfer roll, transferring the coating composition from the transfer roll to an applicator roll which is driven independently of, and rotates in the same sense as, the transfer roll, and transferring the composition from the applicator roll to a moving web of sheet material to be coated, characterised in that the direction of movement of the web at its point of contact with the applicator roll is the same as the direction of movement of the applicator roll surface at that point.

4,347,270

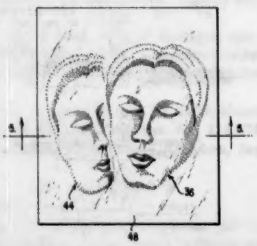
DECORATIVE ARTICLE

Frederick E. Hart, 3019 K St. N.W., Washington, D.C. 20007

Continuation of Ser. No. 757,336, Jan. 6, 1977, abandoned. This application Aug. 29, 1980, Ser. No. 182,593

Int. Cl.³ B44C 5/04

U.S. Cl. 428—13 6 Claims



1. A decorative article comprising in combination a substantially homogeneous mass of transparent material presenting at least one viewing surface, and comprising a first portion which provides said viewing surface and a second portion integrally joined with said first portion but lying beneath said viewing surface, said second portion presenting a shaped, transparent and normally indiscernible interface with said first portion; and means non-uniformly disposed over said shaped interface for providing regions of said interface which remain transparent, indiscernible and limit the visibility of the interface to less than its entirety, and other regions of the interface which are visible when viewed through said viewing surface.

4,347,271

FIBROUS PRODUCT

Richard F. Shannon, Lancaster, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 48,926, Jun. 15, 1979, Pat. No. 4,310,585. This application Apr. 20, 1981, Ser. No. 255,587
Int. Cl.³ F16L 58/16
U.S. Cl. 428—36 8 Claims

1. A molded fibrous pipe wrap insulation comprising a body of fibers of inorganic fiber-forming material, an organic binder in the body of fibers and the organic binder cured, an inner surface region of the fibers of the pipe wrap insulation being further impregnated with hybrid binder comprising organic and inorganic bonding materials and the hybrid binder cured.

4,347,272

FLEXIBLE COMPOSITION OF CORK AND SHEET STRUCTURES MADE THEREFROM

Donald H. Schmidt, 14745 Major Ave., Oak Forest, Ill. 60452

Continuation-in-part of Ser. No. 167,697, Jul. 11, 1980, abandoned. This application Nov. 24, 1980, Ser. No. 209,415
Int. Cl.³ A61F 13/02; B32B 23/00, 9/04; B28B 3/00
U.S. Cl. 428—40 17 Claims

9. A flexible sheet which comprises an intimate mixture of 20 parts by weight of cork granules, said granules containing from 1 to 10 parts by weight of a liquid organic polyol plasticizer for the cork, said cork granules being dispersed and bonded together in a matrix of 4 to 60 parts by weight of a flexible, plasticized polyvinyl chloride resin, said flexible sheet being no more than ¼ inch and carrying on one side thereof a second layer of contact adhesive and a third, peel-sheet layer overlying the contact adhesive layer for peeling away to expose the contact adhesive layer for use.

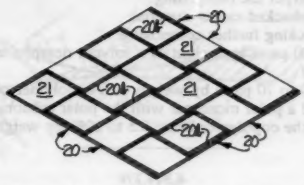
4,347,273

PILE CARPET TILE WITH CUT AND LOOP PILE

Robert V. Dale, North Babylon, N.Y., assignor to Fieldcrest Mills, Inc., Eden, N.C.

Filed May 27, 1981, Ser. No. 267,544
Int. Cl.³ B32B 3/00
U.S. Cl. 428—44 6 Claims

1. A pile carpet tile of square configuration having a pile body of loop pile extending from one end to the opposing end of the tile, and a pair of opposing side marginal areas of cut pile extending along opposite sides of said loop pile body



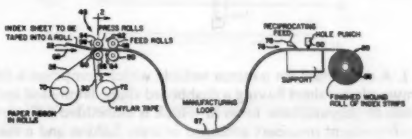
from said one end to said opposing end of the tile, and wherein the cut pile is of greater height than the loop pile body and presents an appearance contrasting with that of said loop pile body.

4,347,274

VISIBLE INDEXES

Alexander P. Janssen, c/o Datastrip Corporation, 1575 Avon St. Extended, Charlottesville, Va. 22901

Continuation-in-part of Ser. No. 30,458, Apr. 16, 1979, Pat. No. 4,250,216, which is a continuation of Ser. No. 795,882, May 11, 1977, abandoned, which is a division of Ser. No. 505,078, Sep. 11, 1974, abandoned. This application Jan. 26, 1981, Ser. No. 228,356
The portion of the term of this patent subsequent to Feb. 10, 1998, has been disclaimed.
Int. Cl.³ B32B 3/14, 3/16
U.S. Cl. 428—78 5 Claims



1. A visible index strip roll comprising: a plurality of serially disposed assemblages, each composed of a plurality of separate and independent index strips, a backing sheet, and means removably attaching said index strips in juxtaposed, face-to-face relationship to said backing sheet; ribbons which are separate and distinct from said assemblages and extend along the series of assemblages on opposite sides thereof, there being perforations in said ribbons at intervals therealong for registering said index strip roll in a process machine; and flexible, adhesively faced tapes spanning, and bonding the perforated ribbons to, the backing sheets of the index strip assemblages, each said tape extending lengthwise over a plurality of said index strip assemblages.

4,347,275

CARPET TILE AND METHOD OF MAKING SAME

Teruo Kajikawa, Yokosuka, and Sakuya Iwai, Tokyo, both of Japan, assignors to Nippon Petrochemical Company, Tokyo, Japan

Filed Mar. 2, 1981, Ser. No. 239,606
Int. Cl.³ B05D 7/24; B32B 11/04
U.S. Cl. 428—95 13 Claims

1. Method of making a carpet tile, which comprises heat-melting a mixture at 100°–240° C., said mixture containing (a) 100 parts by weight of a solvent deasphalted asphalt and (b) 10

to 70 parts by weight of a copolymer of an olefin and a polar monomer with the polar monomer content of the copolymer being 0.5 to 20% by weight, backing a carpet material with the molten mixture, cooling the backed carpet material and then cutting or punching the backed carpet material as desired to produce the carpet tile.

12. A carpet tile comprising:

(i) an unbacked carpet material;

(ii) a backing further comprising:

(a) 100 parts by weight of a solvent deasphalted asphalt, and

(b) 10 to 70 parts by weight of a copolymer of an olefin and a polar monomer with the polar monomer content of the copolymer being 0.5 to 20% by weight.

4,347,276

DASHBOARD FOR MOTOR VEHICLES

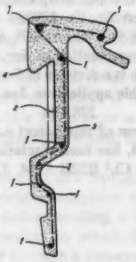
Kurt Weber, Rimbach; Peter Rutsch, Abtsteinach, and Lothar Hirschinger, Mannheim, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Fed. Rep. of Germany

Filed Apr. 7, 1981, Ser. No. 251,769

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1980, 3016199

Int. Cl.³ B32B *3/24, 3/26, 5/00, 5/20*

U.S. Cl. 428—160 9 Claims



1. A dashboard for a motor vehicle which comprises a deep-drawn plastic sheet having a dashboard shape laminated underneath to polyurethane foam in which is embedded a fixture of reinforcement members arranged in truss fashion and a mat of mineral fibers, said mat completely covering all members and spaces of said fixture.

4,347,277

CORROSION RESISTANT COATED ARTICLES WHICH INCLUDE AN INTERMEDIATE COATING LAYER OF A THERMOSETTING POLYMER AND NON-SILICEOUS FILLER

William R. Slama, North Olmsted; Robert B. Washburn, and Dale J. Semanisin, both of Cleveland, all of Ohio, assignors to General Signal Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 957,084, Nov. 3, 1978, Pat. No. 4,237,177. This application Aug. 14, 1980, Ser. No. 178,168

The portion of the term of this patent subsequent to Dec. 2, 1997, has been disclaimed.

Int. Cl.³ B05D *7/00, 1/02*

U.S. Cl. 428—215 11 Claims

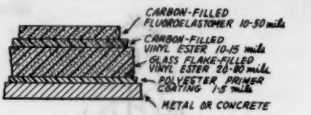
1. A coated article resistant to corrosion or deterioration which comprises:

a substrate;

a primer coating layer in contact with the surface of said substrate, said primer coating layer being a thermosetting polymeric material and having a thickness from about 1 to about 5 mils;

an inner coating layer in bonded contact with said primer coating layer, said inner coating layer being an admixture of a thermosetting polymeric material and a siliceous filler material and having a thickness from about 20 to about 80 mils;

an intermediate coating layer in bonded contact with said inner coating layer, said intermediate coating layer being an admixture of a thermosetting polymeric material and a non-siliceous filler material and having a thickness from about 10 to about 15 mils; and


CARBON-FILLED FLUOROELASTOMER 10-50 mils
CARBON-FILLED VINYL ESTER 10-15 mils
GLASS FLAKE-FILLED VINYL ESTER 20-80 mils
POLYESTER PRIMER COATING 1-5 mils
METAL OR CONCRETE

an outer coating layer in chemically bonded contact with said intermediate coating layer, said outer coating layer being an admixture of a fluoroelastomer and a non-siliceous filler material and having a thickness from about 10 to about 50 mils.

4,347,278

POLYTETRAFLUOROETHYLENE FLUOROCARBON RESIN DISPERSION-CONTAINING COATING COMPOSITION FOR GLASS FIBERS, GLASS FIBERS, AND GLASS FIBER FABRIC COATED THEREWITH

Martin C. Flautt; Robert Wong, both of Granville, and Joseph F. Walsh, Newark, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 16,265, Feb. 28, 1979, which is a continuation of Ser. No. 773,573, Mar. 2, 1977, abandoned. This application Oct. 27, 1980, Ser. No. 200,675

Int. Cl.³ B32B *7/00*; D02G *3/00*

U.S. Cl. 428—288 1 Claim

1. A glass fiber fabric coated with the residue formed by removing water from a padding composition consisting essentially of an aqueous dispersion of polytetrafluoroethylene resin and a lubricant selected from a dispersible vegetable oil, the condensation product of dimethylaminopropylamine with pelargonic acid and an amide-substituted polyethyleneamine, wherein the glass fibers of said fabric are sized with the residue formed by removing water from a sizing composition comprising an aqueous dispersion of polytetrafluoroethylene resin, a film-forming polymer, a thixotropic gelling agent and an organo silane coupling agent.

4,347,279

HIGH PERFORMANCE CARBON FIBER, PROCESS FOR PRODUCTION THEREOF, AND COMPOSITE MATERIALS PREPARED THEREWITH

Yasuo Saji, Mishima; Kozo Tanaka, Numazushi, and Takashi Yamauchi, Shizuoka, all of Japan, assignors to Toho Beslon Co., Ltd., Tokyo, Japan

Filed Aug. 21, 1981, Ser. No. 294,866

Claims priority, application Japan, Aug. 22, 1980, 55-114764

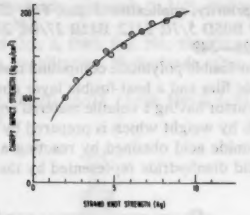
Int. Cl.³ B32B *31/18*

U.S. Cl. 428—294 13 Claims

1. A process for producing a carbon fiber having a single yarn diameter of from 2 to 6 microns and showing a strand knot strength of at least 7 kilograms when formed into a strand of 0.4±0.01 gram per meter, said process comprising: subjecting a 0.1 to 0.6 denier acrylonitrile-based fiber having a tensile strength of at least 6 grams per denier to a preoxidation treatment consisting of (a) a first preoxidation treatment wherein the acrylonitrile-based fiber is treated under such tension as to provide a shrinkage of at least 3% until the equilibrium water content reaches 5%, and (b) a second preoxidation treatment wherein the acrylonitrile-based fiber is treated under such tension as to provide a shrinkage of at least 1%, said preoxidation treatment is conducted in an oxidizing atmosphere having a temperature of from 240° C. to 300° C. while maintaining the

relation between the preoxidation time (t) (minutes) and average preoxidation treatment temperature (T) (°C.) satisfying the equation (I):

$$(310-T)\times(0.8\sim3)=t \quad \text{(I)}$$



and subjecting the thus preoxidized fiber to a carbonization treatment in an inert gas maintained at from 1,000° C. to 1,800° C.

4,347,280

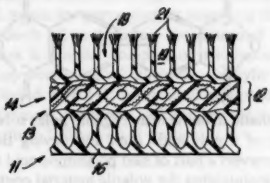
SHOCK ABSORBING SHEET MATERIAL

Charles R. Lau, Key Colony Beach, Fla.; William Jensen, and Perrin A. Allen, both of Norwalk, Conn., assignors to GEOS Corporation, Stamford, Conn.

Filed Jul. 8, 1981, Ser. No. 281,511

Int. Cl.³ B32B *3/00, 3/26;* **A63B** *59/00, 49/00*

U.S. Cl. 428—304.4 **12 Claims**



1. In combination in an impact absorbing material, a laminate having a first, central layer and second and third layer adhered to opposite sides of said first layer, said first layer including a textile base disposed in polyurethane, each of said second and third layers comprising polyurethane, the surface of said second layer remote from said first layer having opened pores.

4,347,281

FOAM BOARD HAVING IMPROVED EVENNESS AND THE METHOD AND APPARATUS FOR ITS CONTINUOUS MANUFACTURE

Steven Futcher, Crumpsall; John J. Gardener, Bury, and Victor F. Hodgson, Worsley, all of England, assignors to Imperial Chemical Industries Limited, London, England

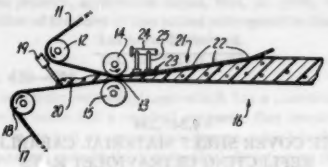
Filed Jan. 8, 1981, Ser. No. 223,301

Claims priority, application United Kingdom, Jan. 17, 1980, 8001534

Int. Cl.³ B29D *27/04*

U.S. Cl. 428—318.4 **7 Claims**

1. A method for the manufacture of foam board consisting of a core of plastics foam, especially polyurethane or polyisocyanurate foam, sandwiched between two flexible facing sheets, the process comprising continuously advancing upper and lower facing sheets in spaced opposed transversely parallel disposition; depositing a liquid mixture of plastics foam-forming ingredients onto at least one of the facing sheets, usually the lower sheet, bringing the sheets into proximate relationship so that both sheets contact the foam-forming mixture; constricting the sheets so that the foam mixture is spread across the width of the sheets and fully occupies the space therebetween; exerting a predetermined constant pressure on and simultaneously applying suction to the upper facing sheet



during expansion of the foam-forming mixture; and thereafter allowing the foam to cure.

2. Foam boards having improved evenness produced the apparatus according to by the method to claim 1.

4,347,282

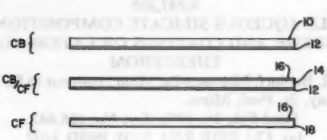
CHEMICAL CARBONLESS COPY PAPER AND TRANSFER MEDIUM THEREFOR

Gerry H. Ehrhardt, West Des Moines, and Gene D. Carlson, Ankeny, both of Iowa, assignors to Frye Copysystems, Inc., Des Moines, Iowa

Continuation-in-part of Ser. No. 34,030, Apr. 27, 1979, abandoned, Ser. No. 34,130, Apr. 27, 1979, abandoned, and Ser. No. 34,131, Apr. 27, 1979, abandoned. This application Jun. 18, 1980, Ser. No. 160,724

Int. Cl.³ B41M *5/22, 5/16*

U.S. Cl. 428—320.4 **24 Claims**



1. A pressure sensitive chemical type transfer medium comprising:

planar sheet material having an at least partially transferable coating layer disposed on one surface thereof constituted by the solidified residue of an applied hot melt low oil content wax base emulsified liquid film including a chemically modified wax-like material having flow agent and dispersant properties homogeneously intermixed therewith and having discrete liquid droplets of a water base solution of an ionized metallic halogen salt electron accepting chromogenic reagent material distributed therein.

4,347,283

TRANSFER-ONTO-PLAIN PAPER TYPE PRESSURE-SENSITIVE COPYING PAPER

Shigetoshi Hiraishi, Tokyo, and Toshihiko Matsushita, Funabashi, both of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Mar. 5, 1981, Ser. No. 240,828

Claims priority, application Japan, Mar. 6, 1980, 55-28374

Int. Cl.³ B32B *3/26;* **B41M** *3/12*

U.S. Cl. 428—320.8 **5 Claims**

1. A transfer-onto-plain paper type pressure-sensitive copying paper produced by coating a substrate with double capsules and wax enclosing said double capsules, which double capsules have been prepared by previously forming primary microcapsules containing, as a core material, either colorless electron-donating color former or colorless electron-accepting

color developer which reacts with said color former to give a colored product, enclosing the formed primary microcapsules in whichever of the color former or the color developer is not contained in the primary microcapsules, and then microencapsulating the enclosed primary microcapsules to form double capsules.

4,347,284

WHITE COVER SHEET MATERIAL CAPABLE OF REFLECTING ULTRAVIOLET RAYS

Obayashi Tsutomu, Tokyo, and Endou Mituo, Souka, both of Japan, assignors to Hiraoka & Co., Ltd., Tokyo, Japan

Filed Nov. 3, 1980, Ser. No. 203,137
Int. Cl.³ B32B 5/16, 15/08; G01S 7/36
U.S. Cl. 428—328 20 Claims

8. A white cover sheet material capable of reflecting ultraviolet rays, which comprises a substrate sheet layer and at least one outer surface layer formed on at least one surface of said substrate sheet layer, said outer surface layer comprising:

(A) a substantially colorless matrix material comprising at least one thermoplastic polymer material and,

(B) a white ultraviolet ray-reflecting agent dispersed in said matrix material and comprising zirconium oxide (ZrO_2).

4,347,285

CURABLE AQUEOUS SILICATE COMPOSITION, USES THEREOF, AND COATINGS OR LAYERS MADE THEREFROM

Vernon H. Batdorf, Minneapolis, Minn., assignor to H. B. Fuller Company, St. Paul, Minn.

Filed Feb. 26, 1981, Ser. No. 238,642
Int. Cl.³ B32B 9/04, 9/06; B05D 3/02
U.S. Cl. 428—332 49 Claims

1. An aqueous silicate composition which is curable at room temperature and which comprises:

(a) an aqueous solution or colloidal dispersion of an alkali metal silicate;

(b) an aqueous latex comprising elastomeric latex particles stably distributed in an aqueous medium;

(c) at least one metal salt of a divalent metal, said metal salt being a coreactant for said alkali metal silicate at room temperature, having a reactivity with alkali metal silicates at least equal to the cations of metals of Group II, A or B, of the Periodic Table, and having a water solubility ranging from about 10^{-1} to 10^{-4} weight-% at a pH of 7 and room temperature; provided that:

if said water solubility is greater than 10^{-2} weight-%, any divalent metal cation of said metal salt is less reactive with alkali metal silicates than Ca^{++}, and

if said water solubility is less than 10^{-3} weight-%, a divalent cation of said metal salt is more reactive with alkali metal silicates than −325 U.S. mesh ZnO;

said component (c) being selected to provide a sufficiently complete curing of said alkali metal silicate to impart, to a 10 mm-thick coating of said composition after 14 days of curing at room temperature, water resistance and a Barcol hardness of at least 10 at the exposed or top surface of the coating; said component (c) also being selected to permit a pot life for said composition of at least 15 minutes at room temperature.

7. A cured layer at least about 1.5 mm. thick on a substrate wherein the layer comprises the composition of claim 1 which has been cured to a crosslinked solid upon the substrate.

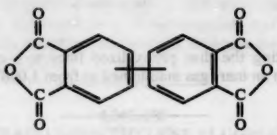
4,347,286

HEAT FUSIBLE POLYIMIDE COMPOUND FILMS AND PROCESS FOR PRODUCING THE SAME

Takashi Ishizuka; Yasuhiro Moriyama, and Masao Nakamura, all of Ibaraki, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

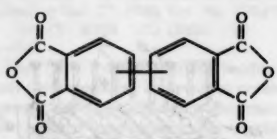
Filed Feb. 25, 1981, Ser. No. 238,283
Claims priority, application Japan, Feb. 25, 1980, 55-23019
Int. Cl.³ B05D 5/10, 5/12; B32B 27/08, 27/28; C09J 7/02
U.S. Cl. 428—349 16 Claims

1. A heat-fusible polyimide compound film which comprises a polyimide film and a heat-fusible layer composed of a polyimide precursor having a volatile material content of about 5 to about 50% by weight which is prepared by converting a part of a polyamide acid obtained by reacting a biphenyltetracarboxylic acid dianhydride represented by the general formula



with an aromatic diamine into imide, provided on at least one surface of said polyimide film.

9. A process for producing a heat-fusible polyimide compound film which comprises applying a solution of a polyamide acid obtained by reacting a biphenyltetracarboxylic acid dianhydride represented by the general formula



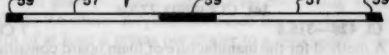
with an aromatic diamine in an organic polar solvent to at least one surface of a polyimide film, and drying thereafter with heating to convert a part of said polyamide acid into the imide form while maintaining the volatile material content at about 5 to about 60% by weight, by which a heat-fusible layer composed of a polyimide precursor is formed.

4,347,287

SEGMENTED PULTRUSIONS COMPRISING CONTINUOUS LENGTHS OF FIBER HAVING SELECTED AREAS ALONG THE LENGTHS CONTAINING RESIN MATRIX IMPREGNATIONS

Armand F. Lewis; Chen-Chi M. Ma; Hoa Quach, and Edward J. Krasnicki, all of Erie, Pa., assignors to Lord Corporation, Erie, Pa.

Filed Aug. 14, 1980, Ser. No. 178,226
Int. Cl.³ B32B 3/10; D02G 3/36
U.S. Cl. 428—378 4 Claims



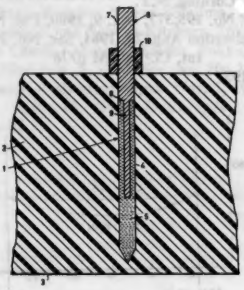
1. A segmented pultruded shape comprising a continuous length of a plurality of fiber reinforcements impregnated with a matrix material; said length of fiber reinforcements having been formed into a continuous series of alternating rigid segments and flexible segments, the matrix material impregnating said rigid segments having been cured and the matrix material impregnating said flexible segments having been removed.

4,347,288

HIGH-VOLTAGE CABLE HAVING A POLYTHENE CONTAINING INSULATION SHEATH WHICH IS PROVIDED WITH MEANS TO AVOID OR IMPEDE THE FORMATION OR THE GROWTH OF WATERTREES, THE MEANS COMPRISING A METAL COMPLEX

Lourens Minnema, and Grietje N. Van Boekel-Mol, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 2, 1980, Ser. No. 194,156
Claims priority, application Netherlands, Oct. 16, 1979, 7907626
Int. Cl.³ B32B *15/02, 15/08;* H01B *3/30*
U.S. Cl. 428—389 5 Claims



1. A high-voltage cable comprising a conductor and an ethylene polymer insulating sheath provided around said conductor and mixed in said insulating sheath a sufficient amount of a chemical means for preventing or impeding the formation of, or the growth of, watertrees, characterized in that said chemical means is a metal complex of a compound selected from the group consisting of diketones, salicylic acid which may be substituted with 1–2 lower alkyl groups and a Schiff's base formed from an amine and salicylaldehyde which may be substituted with 1–2 lower alkyl groups.

4,347,289

USE OF S-119 IN LITHOGRAPHIC FOUNTAIN SOLUTIONS

George T. Colegrove, San Diego, Calif., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 3, 1981, Ser. No. 289,562
Int. Cl.³ B32B *15/04;* C09K *13/04, 13/06, 13/02*
U.S. Cl. 428—457 9 Claims

8. A method of storing image-bearing lithographic plates for prolonged periods of time which comprises coating said plates with an aqueous solution of 0.5 to 5% (by weight) heteropolysaccharide S-119.

4,347,290

STEEL WIRE REINFORCING ELEMENTS

Guy Haemers, Deerlijk, Belgium, assignor to N.V. Bekaert S.A., Zwevegem, Belgium

Division of Ser. No. 40,902, May 21, 1979, Pat. No. 4,255,496. This application Sep. 3, 1980, Ser. No. 183,646
Claims priority, application United Kingdom, May 26, 1978, 23062/78
Int. Cl.³ B32B *15/06, 15/18*
U.S. Cl. 428—625 4 Claims

1. A rubber composition containing at least one steel wire element wherein the steel wire is provided with an adhesive coating comprising a brass alloy containing about 58% to 75% of copper and about 0.5% to 10% of cobalt.

4,347,291

MAGNETIC RECORDING MEDIUM AND PREPARATION THEREOF

Yasumichi Tokuoka, Tokyo, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Nov. 20, 1980, Ser. No. 208,687
Claims priority, application Japan, Nov. 28, 1979, 54/152914
The portion of the term of this patent subsequent to Jan. 5, 1999, has been disclaimed.
Int. Cl.³ G11B *5/62*
U.S. Cl. 428—694 2 Claims

1. A magnetic recording tape which has a coercive force of 1000 Oe or more and a residual magnetic flux density of 2000 gauss or more and an orientation degree, which is the ratio of the squareness ratio in the longitudinal direction to the squareness ratio in the transverse direction, of

$$\text{Orientation degree} \geqq 4.90 \times \frac{\text{squareness ratio}}{\text{in longitudinal direction}} - 1.87$$

comprising: a magnetic metallic iron powder mixed with a binder and coated on a substrate;

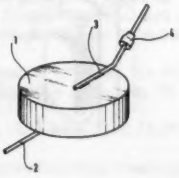
wherein said magnetic metallic iron powder is prepared by forming an alkaline aqueous slurry of an acicular hydrated iron oxide or an acicular iron oxide having a pH in the range of 8 to 14, adding a water soluble silicate to said slurry in an amount of 0.1 to 10 mol%, as SiO_2 to Fe, treating said slurry by a hydrothermal reaction in a closed reactor at 100° to 250° C. for 5 minutes or longer, dehydrating and drying said slurry to obtain a dry iron oxide containing an SiO_2 component, and converting it into a magnetic metallic iron powder by reduction in a hydrogen reducing atmosphere.

4,347,292

ELECTRIC CELL ASSEMBLY WITH AN ALKALINE ELECTROLYTE AND CURRENT OUTPUT WIRES

Alain Bernard, Pessac, and Raymond Bonnaterre, Merignac, both of France, assignors to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed Jun. 24, 1981, Ser. No. 276,981
Claims priority, application France, Jun. 30, 1980, 80 14533
Int. Cl.³ H01M *2/32*
U.S. Cl. 429—65 3 Claims

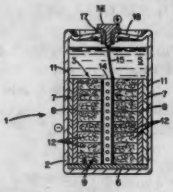


1. An electric cell assembly having an alkaline electrolyte and current output wires electrically connected to the positive terminal and negative terminal of the electric cell assembly, wherein the metal wire which corresponds to the negative terminal is surrounded, near said terminal and entirely outside the electric cell, with a bead made of a glass which is practically unalterable by said electrolyte.

4,347,293
ELECTROCHEMICAL CELL

Franz Goebel, Sudbury, and Cyril Morgan, Manchester, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 29, 1980, Ser. No. 145,181
Int. Cl.³ H01M 6/02
U.S. Cl. 429—105 11 Claims



1. A carbon current collector cathode structure for use with an electrolytic solution of an electrochemical system of a primary electrochemical cell, said carbon current collector cathode structure comprising:

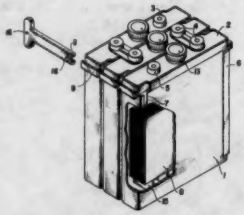
a plurality of individual porous carbon elements superimposed one above the other in a stacked array and each having a network of electrolyte-conducting channels formed therein for receiving an electrolytic solution by which the carbon element can be permeated by the electrolytic solution, each of said carbon elements having an opening extending completely therethrough; and

an elongated, hollow, metal current collector tube having a plurality of openings formed therein along its length and positioned within and along the openings in the stacked array of carbon elements and in direct physical contact with the porous carbon elements of the stacked array, said current collector tube being adapted to receive an electrolytic solution therein and to supply said electrolytic solution to the array of stacked carbon elements by way of the openings formed therein whereby the electrolytic solution can permeate the carbon elements by way of the electrolyte-conducting channels formed in the carbon elements.

4,347,294
NOVEL ELECTRIC STORAGE BATTERY ASSEMBLY

Santiago Mejia, Cerrera 30 No. 12-99, Bogota, Colombia

Filed Feb. 12, 1981, Ser. No. 234,509
Int. Cl.³ H01M 6/42
U.S. Cl. 429—151 5 Claims

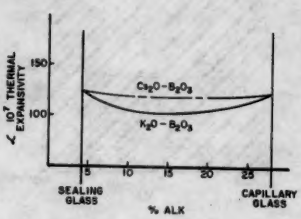


1. A composite electric storage battery assembly comprising a plurality of removably interlocked individual cell casing units, each of said units being provided on alternate corner edges with vertical dovetail projecting ribs and dovetail grooves, the dovetail ribs and grooves of adjacent cell units matingly and removably interengaging with one another, a plurality of removable conductor straps mechanically and electrically interconnecting the electrode terminal posts of adjacent cell units in a series arrangement, each of said cell units being covered and closed by a lid provided with openings to receive the terminal posts of the cell unit and a screw threaded hollow boss to permit the filling of the cell with an electrolyte fluid, said boss being closed off by a correspondingly threaded mating filler cap, each of said lids having a horizontal rib which removably and matingly engages with a corresponding shaped recess formed in a horizontally slidable transverse lug.

4,347,295
SEALING GLASSES FOR ELECTROCHEMICAL, ELECTRICAL, ELECTRONIC, AND OPTICAL APPLICATIONS

Andrew Herczog, Hammondsport, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 195,377, Oct. 9, 1980, Pat. No. 4,311,772.
This application Aug. 20, 1981, Ser. No. 294,472
Int. Cl.³ H01M 6/18
U.S. Cl. 429—193 6 Claims

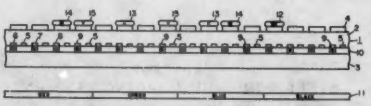


1. A sealing glass comprising, expressed in mole percent on the oxide basis as calculated from the batch, of about 3–30% R_2O and 60–95% B_2O_3, wherein R_2O consists of at least one alkali metal oxide selected from the group of K_2O, Rb_2O, and Cs_2O, the sum of $R_2O+B_2O_3$ constituting at least 70 mole percent of the total composition, sealed to a base glass containing at least 10% by weight of an alkali metal oxide having a smaller alkali metal than an alkali metal oxide in said sealing glass, said sealing glass having a softening point below the annealing point of the glass to be sealed and a coefficient of thermal expansion closely compatible with that of the base glass.

4,347,296
ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER AND ELECTROPHOTOGRAPHIC PROCESS

Shunichi Ishihara, Kodaira; Nobuo Kitajima, Toride; Yuji Nishigaki, Kawasaki, and Nobuko Kitahara, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1980, Ser. No. 201,479
Claims priority, application Japan, Nov. 1, 1979, 54-142305
Int. Cl.³ G03G 13/01, 5/14
U.S. Cl. 430—42 8 Claims



1. A color electrographic process which comprises:

applying a voltage between a transparent electrode and a color filter electrode of an electrophotographic photosensitive member comprising isolated conductive members for forming elements a substrate, and a photoconductive element therebetween, said photoconductive element having, at least one transparent electrode and color filter electrodes, conducting imagewise exposure from the substrate side, resulting in the formation of a difference in distribution voltage between the area where light passes

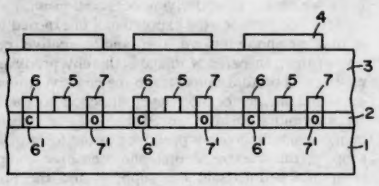
through a color filter electrode and the area where light does not pass through a color filter electrode with regard to the voltage distribution between the transparent electrode and the isolated conductive member and between the color filter electrode and the isolated conductive member, thereby forming a voltage image depending upon the change of voltage of the isolated conductive member produced corresponding to the difference in the distribution voltage, and developing the voltage image with a color toner corresponding to the color light passing through the color filter electrode.

4,347,297

ELECTROPHOTOGRAPHIC METHOD AND ELEMENT

Shunichi Ishihara, Kodaira; Nobuo Kitajima, Toride; Yuji Nishigaki, Kawasaki, and Nobuko Kitahara, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1980, Ser. No. 204,286
Claims priority, application Japan, Nov. 5, 1979, 54/142933
Int. Cl.³ G03G *13/01, 5/14*
U.S. Cl. 430—42 6 Claims



1. An electrophotographic method which comprises the steps of:

(a) simultaneously applying voltages between a transparent electrode and two other electrodes in an electrophotographic photosensitive member comprising a multitude of isolated electrically conductive overlayers for image element formation, a photoconductive layer, a multitude of sets of electrodes, each set of electrodes being composed of a nontransparent electrode layer, a transparent electrode layer, a color filter electrode layer, and a substrate, to effect the color image exposure from the side of the color filter electrode to thereby produce differences between a region corresponding to those color portions in the image original having wavelength regions not transmitting through the color filter electrode but transmitting through the transparent electrode and each of a region corresponding to a white portion in the image original where light transmits through both the transparent electrode and the color filter electrode, a region corresponding to a color portion in the image original having a wavelength region which transmits through the color filter electrodes, and a region corresponding to a black portion in the image original where no light transmits through the transparent electrode and the color filter electrode with respect to the distributed voltages between the transparent electrode and the isolated electrically conductive member, between the color filter electrode and the isolated electrically conductive member, and between the nontransparent electrode and the isolated electrically conductive member; and

(b) causing a developing material to be selectively adhered to the isolated electrically conductive member of the region corresponding to those color portions in the image original having wavelength regions not transmitting through the color filter electrode but transmitting through the transparent electrode, by a difference in the electric potential of said isolated electrically conductive member which occurs in correspondence to the difference in the distributed voltages.

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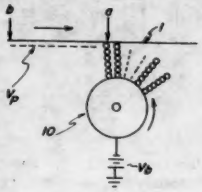
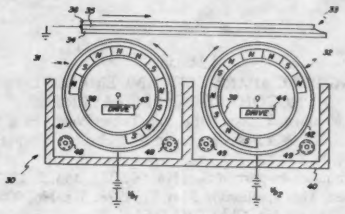
ELECTROGRAPHIC DEVELOPMENT APPARATUS AND METHOD FOR USE WITH PARTIALLY-CONDUCTIVE DEVELOPER

Arthur S. Kroll, Spencerport, and Frank A. Shuster, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 27,115, Apr. 4, 1979, Pat. No. 4,292,921.
This application Apr. 27, 1981, Ser. No. 258,228
Int. Cl.³ G03G *13/06, 13/08*
U.S. Cl. 430—97 11 Claims





1. A method of developing an electrostatic image on the surface of an image member, said method comprising:

(a) moving said member past a development zone in a downstream direction;

(b) at a first location in said zone transporting partially-conductive electrographic developer across said surface in a direction generally opposite said downstream direction; and

(c) at a second location in said zone transporting partially-conductive developer across said surface in generally said downstream direction.

4,347,299

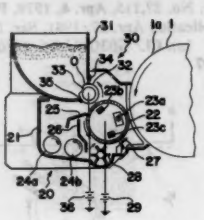
METHOD OF CONTROLLING TONER CONCENTRATION FOR ELECTROPHOTOGRAPHIC COPYING APPARATUS

Hiroshi Ozawa, and Masao Tokumoto, both of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 16, 1979, Ser. No. 67,238
Claims priority, application Japan, Aug. 16, 1978, 53-100309; Jan. 20, 1979, 54-5817
Int. Cl.³ G03G *13/08, 13/09*
U.S. Cl. 430—122 15 Claims

1. A method of controlling toner concentration for an electrophotographic copying apparatus including a developing device for developing an electrostatic latent image formed on a photosensitive member into a visible toner image with a two-component developing material which is composed of triboelectrically chargeable toner and magnetizable carrier and fed to a developing station by a developing sleeve having a plurality of magnets arranged in the interior thereof, said method comprising the steps of collecting an amount of toner corresponding to the concentration of the developing material

from the toner left on said developing sleeve after developing the image by means of a toner collecting roller impressed with a voltage opposite in polarity to the toner and rotatably disposed to contact the flow of said developing material on said developing sleeve at a point past, in the direction of movement of the developing material, the position at which the develop-



ing sleeve supplies the toner to the photosensitive member, supplying approximately a predetermined constant amount of toner to said developing sleeve for replenishing the toner thus collected, and varying the voltage impressed on said toner collecting roller so as to correspond to the state of image to be copied.

4,347,300

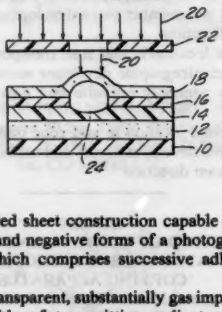
IMAGING PEEL APART ELEMENT EMPLOYING TWO PHOTOHARDENABLE LAYERS

Ken-Ichi Shimazu, Pleasantville, and Takao Nakayama, Yonkers, both of N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Continuation-in-part of Ser. No. 802,851, Jun. 2, 1977, abandoned. This application May 11, 1978, Ser. No. 904,840

Int. Cl.³ G03C *1/54, 1/78*

U.S. Cl. 430—156 **6 Claims**



1. A multi-layered sheet construction capable of reproducing both positive and negative forms of a photographic transparency image which comprises successive adherent layers comprised of:

(a) A flexible, transparent, substantially gas impermeable top support capable of transmitting radiant energy therethrough and having adhered to one surface thereof;

(b) A first photosensitive composition layer which comprises (i) a major amount of a light-sensitive, substantially gas generating diazonium substance and may contain (ii) minor amounts of resinous materials, such that said photosensitive composition disintegrates with a concurrent forced expulsion of gas upon exposure to an ultraviolet energy supply to which it is reactive, said photosensitive layer having adhered thereto;

(c) An image forming layer comprising a resinous material which is capable of being imagewise separated upon the application of dissociative shearing forces, said image forming layer comprising, based on weight of solids:

I. From about 25% to 100% light sensitive composition comprising (i) up to 10% photoinitiator, (ii) at least 90% material capable of hardening, crosslinking or polymerizing upon being blended with said photoinitiator and being exposed to ultraviolet radiation; and

II. Up to 75% of materials selected from the group consisting of binding resins, fillers and colorants, said image forming layer having adhered thereto;

(d) A bottom support having a substantially regular surface, whereby, upon exposure of the multi-layered sheet construction to an ultraviolet radiant energy source through a photographic transparency from the direction of the top transparent support, said energy causes said first photosensitive composition to spontaneously, outwardly expel a gas so as to exert outward forces on said top support and said image layer at the exposed locations, thereby forming an imagewise bubble system which is visible through said top support, said radiant energy is transmitted through said first photosensitive composition layer and reaches and reacts with said image forming composition layer, causing the light sensitive composition in said image forming layer to harden at the thusly exposed locations such that upon a subsequent separation of said bottom and said top supports, solely by means of peeling forces, an imagewise shearing of the image layer is effected along interfaces which are in underlying registration with an interface formed between the exposed and unexposed portions of the first photosensitive layer; and a negative reproduction of the transparency image is thereby produced comprising said bottom support, and the negatively imagewise separated image forming layer attached to the bottom support, and a positive reproduction of the transparency image is simultaneously produced in the form of said top support, the unexposed first photosensitive composition layer attached to said top support, and the positively imagewise separated image forming layer material attached to and in registration with said unexposed first photosensitive layer.

4,347,301

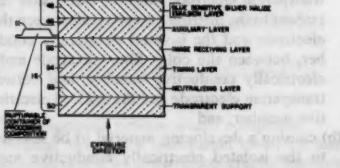
NOVEL DIFFUSION TRANSFER FILM UNITS

Peter O. Kliem, Weston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 26, 1980, Ser. No. 210,808

Int. Cl.³ G03C *5/54*

U.S. Cl. 430—215 **44 Claims**



15. A photographic diffusion transfer film unit comprising a support carrying at least one photosensitive element comprising a first and second photosensitive silver halide layer and a dyeable receiving layer adapted to receive a dye image diffusing thereto after photoexposure and processing of said photosensitive element; said first and second silver halide layers being sensitive to substantially the same spectral absorption

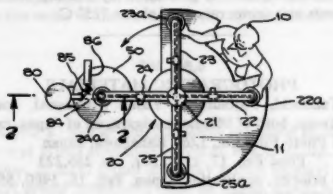
region; said first and second photosensitive silver halide layers having associated therewith a material which provides a dye image forming material which is diffusible during processing as a function of the point-to-point degree of silver haide exposure to actinic radiation; and, intermediate and contiguous to said first and second photosensitive silver halide layers, a spacer layer consisting essentially of particles which are substantially non-swelling in alkali, and substantially non-film forming; said particles being less than or equal to the silver halide grains in average diameter; said silver halide grains being 2.5μ or less in average diameter.

4,347,302

PROCESS FOR APPLYING A THIN COATING IN LIQUID FORM AND SUBSEQUENTLY DRYING IT

Alexander Gotman, 818 Fifth St., Apt. 5, Santa Monica, Calif. 90403

Filed Jun. 6, 1980, Ser. No. 157,185
Int. Cl.³ B05D *5/12, 3/12*
U.S. Cl. 430—270 **7 Claims**



1. In a method wherein a liquid coating material is applied to the surface of a substrate while the substrate is being spun in order to provide a thin coating on its surface, and wherein the coating is subsequently dried, the improvement comprising:

(a) selecting a coating chamber;

(b) charging the atmosphere of the coating chamber with a solvent for the coating material in a saturated vaporous form;

(c) placing the substrate inside the coating chamber;

(d) then depositing a quantity of the liquid coating material upon one surface of the substrate;

(e) rotating the substrate about a self-contained vertical axis so as to radially disperse the liquid and thereby form a coating of uniform thickness on the substrate, by virtue of the saturated atmosphere which prevents any drying action upon the coating;

(f) then selecting a drying chamber and, without exposing the interior of the coating chamber to outside atmosphere, placing the drying chamber in communication with the coating chamber so that the saturated atmosphere then occupies both chambers;

(g) moving the coated substrate from the coating chamber into the drying chamber;

(h) then independently sealing the drying chamber so as to retain both coated substrate and saturated atmosphere therein; and

(i) thereafter initiating a drying action in the drying chamber so as to eliminate the saturated atmosphere therein while also drying the coating.

4,347,303

DRY PLANOGRAPHIC PRINTING PLATE WITH ORGANIC ACID ADDITIVE

Masaya Asano; Yoichi Mori, and Yoshiaki Takayama, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

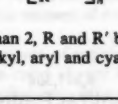
Continuation of Ser. No. 86,326, Oct. 19, 1979, abandoned. This application May 18, 1981, Ser. No. 264,617
Claims priority, application Japan, Oct. 20, 1978, 53/128577
Int. Cl.³ G03C *1/74, 1/68;* G03F *7/10*
U.S. Cl. 430—272 **4 Claims**

1. A positive acting presensitized dry planographic printing plate comprising:

(a) a base layer having sufficient strength to withstand the stress normally encountered in the printing process;

(b) a photo-sensitive layer superimposed on the base layer comprising at least one photopolymerizable unsaturated compound having a boiling point above about 100° C., a photoinitiator and an organic acid, the amount of said organic acid is such that the total concentration of the acid group in the photosensitive layer is in the range of about 0.01 m mol/g to 1.0 m mol/g; and

(c) a silicone rubber layer superimposed on the photo-sensitive layer with or without an intervening layer comprising one or more silicone primers or silane coupling agents or combination thereof, wherein said silicone rubber layer comprises crosslinked diorganopolysiloxanes having the central repeating unit of



wherein n is not less than 2, R and R′ being selected from the groups consisting of alkyl, aryl and cyanoalkyl groups having 1–20 carbon atoms.

4,347,304

PROCESS FOR FORMING METALLIC IMAGE

Hideki Sakurai, Sendai; Mitsuo Nakatani, Yokohama; Hitoshi Oka, Yokohama; Hitoshi Yokono, Yokohama, and Tokio Isogai, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 24, 1981, Ser. No. 277,049
Claims priority, application Japan, Jun. 25, 1980, 55/85099; Jun. 25, 1980, 55/85100
Int. Cl.³ G03C *5/00*
U.S. Cl. 430—291 **8 Claims**

1. A process for forming a metallic image comprising coating a solution of a photosensitive material on the surface of a substrate having through-holes and on the through-hole parts, drying the photosensitive material, irradiating the resulting substrate with an actinic light through a photo-mask, and contacting the resulting substrate with a solution of metallic salt to deposit metal particles on the unexposed portions, characterized in that as the photosensitive material there is used either one of the following (a) or (b):

(a) at least one member selected from organic compounds having in the molecule at least one linkage of the formula: —M—(—M—M)$_n$—, wherein M is at least one member selected from the group consisting of Si, Ge and Sn, and n is zero or 1 or more,

(b) a mixture of at least one above-mentioned compound (a) and at least one photosensitizer selected from the group consisting of nitrofluorene and derivatives thereof, benzophenone and derivatives thereof, acetophenone and derivatives thereof, benzil and derivatives thereof, benzoin and derivatives thereof,

dissolved in a solvent (c) selected from the group consisting of halogenated hydrocarbons, aromatic hydrocarbons, heterocyclic compounds, and a mixture thereof.

4,347,305

PHOTOSENSITIVE LITHOGRAPHIC PRINTING PLATE PRECURSORS AND METHODS OF PREPARING PRINTING PLATE THEREFROM

Keisuke Shiba, and Tadao Toyama, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 21, 1980, Ser. No. 198,999
Claims priority, application Japan, Oct. 23, 1979, 54-136729
Int. Cl.³ G03F 7/02
U.S. Cl. 430—302 10 Claims

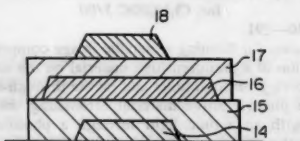
1. A method of preparing a planographic printing plate utilizing a photosensitive lithographic printing plate precursor comprising an aluminum support having a hydrophilic surface, (a) a positive type non-silver photosensitive layer capable of providing an oleophilic image and (b) a photographic silver halide emulsion layer, said emulsion being unfogged and internally sensitized type, containing a fogging agent and free from any tanning developing agent, the two coatings (a) and (b) being superimposed on the support in order, said method comprising imagewise exposing said photosensitive planographic printing plate, processing said silver halide emulsion with a surface developer free from a fogging agent to obtain a corresponding silver image, irradiating said positive type non-silver photosensitive layer through said silver image with light active to said non-silver photosensitive layer, and finally removing the irradiated portion of said positive type non-silver photosensitive layer to expose the hydrophilic surface of said underlying aluminum support.

4,347,306

METHOD OF MANUFACTURING ELECTRONIC DEVICE HAVING MULTILAYER WIRING STRUCTURE

Shiro Takeda, Sagamihara, and Minoru Nakajima, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 12, 1980, Ser. No. 148,722
Claims priority, application Japan, May 12, 1979, 54-57611; Dec. 26, 1979, 54-168113; Dec. 26, 1979, 54-168124; Dec. 27, 1979, 54-169156
Int. Cl.³ G03C 5/00
U.S. Cl. 427—96 28 Claims



1. In a method of manufacturing on a substrate an electronic device including a multilayer wiring structure comprising forming an interlayer insulation layer comprised of a thermosetting polyimide between a previously formed respective lower metal layer of wiring and a subsequently formed respective upper metal layer of wiring, said method comprising forming said multilayer wiring structure to have at least one of said interlayer insulation layers between at least one pair of said respective upper and lower metal wiring layers, the improvement comprising using as the thermoset polyimide an addition polymerization type polyimide comprising imide rings in the recurring groups and reactive end groups with triple bonds.

4,347,307

DIMENSIONALLY STABILIZED IMAGING ELEMENT AND METHOD

Raymond F. Limoges, Rochester; Anthony A. Scribani, Fairport, and Robert J. Wilson, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 202,401, Oct. 31, 1980, Pat. No. 4,308,342.
This application Aug. 3, 1981, Ser. No. 289,844
Int. Cl.³ G03C 1/52
U.S. Cl. 430—338 4 Claims

1. In a method of making an imaging element comprising, on a polymeric film support, at least one layer comprising an amine-generating composition that includes a reducible cobalt-(III) complex containing releasable amine ligands, and an amine-responsive dye precursor; the method comprising the steps of

(a) coating said composition and said precursor onto a support having dimensional changes that are no greater than ±0.1% in width and length when heated in an uncoated state for about 5 seconds at a temperature of about 125° C., to form at least one layer and;

(b) drying said layer to form the element;

the improvement wherein said method further includes, prior to exposure of the element to activating radiation, the additional steps of (c) dimensionally stabilizing said dried element by heating said dried element to a temperature of between about 100° C. and about 140° C. for a length of time sufficient to form in said element an overall thermal-reaction hysteresis that produces dimensional changes of no greater than ±0.03% in width or length when said element is processed by heating for about 5 seconds at a temperature of about 125° C.

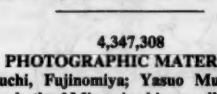
4,347,308

PHOTOGRAPHIC MATERIALS

Tetsuo Takeuchi, Fujinomiya; Yasuo Mukunoki, and Junji Minanizono, both of Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 17, 1981, Ser. No. 235,223
Claims priority, application Japan, Feb. 15, 1980, 55-18089; Feb. 15, 1980, 55-18090
Int. Cl.³ G03C 1/38, 1/76, 1/84, 1/82
U.S. Cl. 430—529 21 Claims

1. A photographic light-sensitive element comprising a silver halide and containing in at least one photographic layer thereof a compound of formula (I)



(I)

wherein at least one of R_1 and R_2 is a fluorine-substituted alkyl group, and R_1 or R_2 can be a substituted or unsubstituted alkyl or aryl group, and M is a cation.

4,347,309

PHOTOSENSITIVE POLYPHOSPHATE COMPRISING AG AND CL

Che-Kuang Wu, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 25, 1981, Ser. No. 237,853
Int. Cl.³ G03C 1/02, 1/52
U.S. Cl. 430—616 3 Claims

1. A photosensitive polyphosphate comprising Ag and Cl which is produced by:

(a) condensing a mixture comprising KH_2PO_4 and Ag_3PO_4 in weight ratio (KH_2PO_4:Ag_3PO_4) in the range of about 50:1 to 1:1 to cause water evolution and the formation of a solid or liquid condensation product therefrom; and

(b) reacting the condensation product of (a) with dissolved NaCl to provide a photosensitive polyphosphate product.

4,347,310
HEAT DEVELOPABLE SILVER IMAGE FORMING MATERIALS

Tetsuo Shiga, Fuji, Japan; Masaru Ozaki, Drexel Hill, Pa.; Tatsumi Arakawa, Fuji, Japan; Takeo Kimura, Fuji, Japan, and Hidehiko Kobayashi, Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 113,415, Jan. 18, 1980, abandoned, which is a continuation of Ser. No. 951,546, Oct. 16, 1978, abandoned. This application Apr. 29, 1981, Ser. No. 258,859

Claims priority, application Japan, Oct. 14, 1977, 52-122479

Int. Cl.³ G03C *1/02*

U.S. Cl. 430—620 **8 Claims**

1. A post-activatable heat developable silver image forming material comprising:

(a) a silver salt of a long chain aliphatic carboxlic acid having 12 to 24 carbon atoms;

(b) at least one member selected from the group consisting of (i) organic haloamides having a unit of —CONX— or —SO_2NX, wherein X represents a chlorine atom, a bromine atom or an iodine atom, (ii) iodine, and (iii) a compound or a composition comprising a halogen atom as a halogen component and an organic component containing an element of Groups IV, V or VI of the Periodic Table excluding sulfur and whose atomic number is 14 or more, said member being capable of forming a photosensitive silver compound by reaction of 0.01 to 0.5 mole thereof with 1 mole of the silver salt (a);

(c) a reducing agent for silver ion in an amount of 0.1 percent by weight to 200 percent by weight based on the weight of the silver salt (a); and

(d) a compound in an amount of 0.03 mole to 2 moles based on the mole of the silver salt (a), of the formula

$$R^1NH—\overset{\overset{NH}{\|}}{C}—NHR^2$$

wherein R^1 and R^2 independently represent an aryl group; an aryl group substituted with an acetyl group, an amino group, an alkyl group or alkoxy group; an alkyl group; an alkyl group substituted with an amino group, a carboxyl group, a mercapto group or an acetyl group; a cycloalkyl group; a S-, Se-, O- or N-containing heterocyclic group; an amidinyl group; a sulfanil group; a cyano group; an amino group; a nitro group and a hydrogen atom; malonyl guanidine or guanine.

4,347,311
ENZYME IMMUNOASSAY FOR DETERMINING ANTIGEN SPECIFIC ANTIBODIES AND TEST KIT FOR CARRYING OUT THIS ASSAY

Hans H. Schmitz, Hamburg, Fed. Rep. of Germany, assignor to MEDAC Gesellschaft fur Klinishce Spezialpraparate mbH, Hamburg, Fed. Rep. of Germany

Filed Jul. 2, 1980, Ser. No. 165,395

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1979, 2930706

Int. Cl.³ G01N *33/54;* C12Q *1/70;* C12N *9/96*

U.S. Cl. 435—5 **4 Claims**

1. An enzyme immunoassay method for determining the presence of antibodies which are specific to antigens using enzyme-labelled viruses or microbial cells in an antibody-antigen reaction, said method comprising the sequential steps of:

(a) coating a solid support with antibodies which selectively bind IgM, IgA, IgG or IgE antibodies which are to be determined in a serum specimen;

(b) contacting the coated support with the serum specimen containing the antibodies to be determined which antibodies are selectively bound by the antibodies of the coated support;

(c) removing unbound components of the specimen from the support;

(d) reacting the selectively bound antibodies at pH about 8.7 with a solution containing: carbonate buffer, calf serum, non-ionic detergent and a peroxidase conjugate of a virus or a microbial cell which conjugate is highly specific to the bound antibody and which conjugate has been prepared by periodate coupling the virus or microbial cell in a carbonate buffer of pH about 9.3 and of high mg/ml virus or microbial cell concentration; and thereafter

(e) determining the enzyme activity of the reaction product as a measure of the presence of the antibodies to be determined.

4,347,312
DETECTION OF ANTIBIOTICS IN MILK

Rodney J. Brown, Logan, Utah, and Harold E. Swaisgood, Raleigh, N.C., assignors to Research Triangle Institute, Research Triangle Park, N.C.

Filed Mar. 20, 1980, Ser. No. 131,914

Int. Cl.³ G01N *33/54;* C12N *9/96*

U.S. Cl. 435—7 **14 Claims**

1. A method for detecting the presence of antibiotics having a lactam ring in milk which comprises the steps of:

(a) contacting a solid matrix having attached thereto a purified immobilized antibody with a volume of milk and an enzyme-labeled antibiotic having a lactam ring, said antibody being specific to said antibiotic and said enzyme-labeled antibiotic being covalently conjugated to the antibiotic through a carboxy group in the antibiotic molecule;

(b) separating the matrix from the milk and rinsing the matrix with water to remove excess milk and enzyme-labeled antibiotic;

(c) contacting the rinsed matrix with a substrate, said substrate in the presence of said enzyme-labeled antibiotic exhibiting a color change the amount of which is quantitatively related to the amount of enzyme-labeled antibiotic; and

(d) measuring the amount of antibiotic present in said milk by comparing the color change in said substrate with a standard, said purified immobilized antibody having been prepared according to the steps which comprise:

(i) covalently conjugating an antibiotic having a lactam-ring to a protein through said lactam-ring;

(ii) injecting into a host animal capable of raising antibodies specific to said antibiotic the conjugate obtained in step (i) so as to raise said specific antibodies;

(iii) covalently conjugating the sme antibiotic as used in step (i) to a second protein capable of binding thereto through said lactam-ring and different than the protein used in step (i) to form a second conjugate;

(iv) covalently binding said second conjugate to a solid matrix to form an affinity matrix for purifying the antibodies;

(v) isolating and purifying the specific antibiodies raised in step (ii) by contacting the host animal serum with the affinity matrix; and

(vi) recovering the specific antibodies in a pure form and immobilizing the purified antibodies on a solid matrix.

4,347,313
ANALYTICAL DETERMINATION OF LIPASE

Henning F. Proelss, Birmingham, Ala., assignor to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

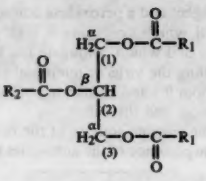
Continuation of Ser. No. 881,756, Feb. 27, 1978, abandoned. This application Nov. 24, 1980, Ser. No. 210,120

Int. Cl.³ C12Q *1/26, 1/44*

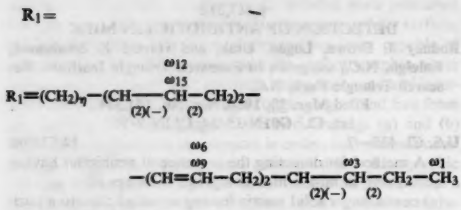
U.S. Cl. 435—19 **21 Claims**

1. A method for the specific determination of lipase activity in a biological fluid comprising:

(a) adding a sample of a biological fluid sample to an emulsified substrate, constituting a heterogeneous system, containing from about 1.0×10^{-4} mole per liter to about 4.0×10^{-4} mole per liter of a water-insoluble triglyceride having the structural formula:



R_1=



n=1, (2), 3, (4), 5

R_2=a member selected from the group consisting of R_1 and saturated or (poly)unsaturated fatty acid alkyl chains;

and wherein said substrate also contains a bile salt;

(b) simultaneously, or immediately thereafter, adding an amount of lipoxygenase high enough to convert the acid produced by lipolysis to its acid hydroperoxide at a rate sufficient to ensure that lipolysis is the limiting reaction but low enough to ensure that the rate of reaction with said substrate itself remains low; and

(c) measuring the production of said acid hydroperoxide.

4,347,314
PROCESS FOR THE PREPARATION OF PENICILLIN DERIVATIVES

Martin Cole, and Robert A. Edmondson, both of Dorking, England, assignors to Beecham Group Limited, England

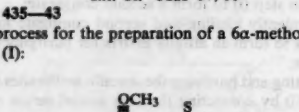
Filed May 13, 1980, Ser. No. 149,342

Claims priority, application United Kingdom, May 15, 1979, 7916773

Int. Cl.³ C12P *37/00*

U.S. Cl. 435—43 **7 Claims**

1. A process for the preparation of a 6α-methoxy penicillin formula (I):



(I)

wherein R represents phenyl or 2- or 3-thienyl, which process comprises subjecting a compound of formula (IV):

(IV)

where R^1 is an aryl radical , to the action of an enzyme selected from the group consisting of bromelain, papain, gelatase, trypsin, pancreatin and an esterase-producing strain of *Escherichia coli, Pseudomonas aeruginosa, Aspergillus niger*, and Saccharomyces sp.

4,347,315
SYNTHESIS OF RIBOSIDES USING BACTERIAL PHOSPHORYLASE

Thomas A. Krenitsky, Chapel Hill, and Janet L. Rideout, Raleigh, both of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Apr. 25, 1980, Ser. No. 143,832

Int. Cl.³ C12P *19/38*

U.S. Cl. 435—87 **9 Claims**

1. A method for the preparation of 4-substituted-1-B-D-ribofuranosyl-1H-imidazo(4,5-c)pyridines which method comprises the reaction of the corresponding 4-substituted-1H-imidazo(4,5-c)pyridine with a ribose donor system comprising ribose-1-phosphate and bacterial phosphorylase enzyme.

4,347,316
PROCESS FOR ISOMERIZING GLUCOSE TO FRUCTOSE

Toshio Yoshioka; Kazuo Teramoto, and Masaharu Shimamura, all of Ohtsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

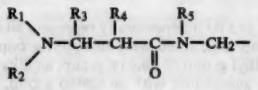
Continuation of Ser. No. 114,270, Jan. 22, 1980, Pat. No. 4,275,156. This application May 22, 1981, Ser. No. 266,155

Claims priority, application Japan, Jan. 23, 1979, 54/6727

Int. Cl.³ C12P *19/24*

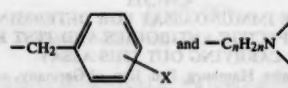
U.S. Cl. 435—94 **13 Claims**

1. A process for isomerizing to produce fructose from glucose, comprising bringing a glucose-containing solution into contact with an enzymatically active product comprising an organic polymeric material comprised of at least 50% by weight, based on the weight of the organic polymeric material, of a monovinyl aromatic compound in polymerized form, said polymerized monovinyl aromatic compound having a β-aminopropionamidomethyl group as a side chain represented by the formula I:

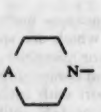


I

wherein R_1 is selected from hydrogen, an alkyl group having 1 to 6 carbon atoms and a hydroxyalkyl group having 2 to 6 carbon atoms, R_2 is selected from an alkyl group having 1 to 6 carbon atoms, a hydroxyalkyl group having 2 to 6 carbon atoms,



(where X, Z_1 and Z_2 are selected from hydrogen and an alkyl group having 1 to 6 carbon atoms, and n is an integer of from 2 to 6), or R_1 and R_2 form together with the nitrogen atom, to which R_1 and R_2 are bonded, a heterocyclic structure represented by the formula:



where A is —CH_2—, —O— or —NR_6-(wherein R_6 is H or an alkyl group having 1 to 6 carbons), and R_3, R_4 and R_5 may be the same as or different from each other and are selected from hydrogen and a methyl group, said organic polymeric material having glucose isomerase immobilized with said side chain of the organic polymeric material, whereby at least a part of the glucose is isomerized into fructose.

4,347,317

METHOD FOR PRODUCING L-GLUTAMIC ACID BY FERMENTATION

Minoru Yoshimura, Kawasaki; Yoshihiro Takenaka, Fujisawa; Shigeho Ikeda, and Hiroe Yoshii, both of Yokohama, all of Japan, assignors to Ajinomoto Company, Incorporated, Tokyo, Japan

Filed Aug. 6, 1980, Ser. No. 175,705
Claims priority, application Japan, Aug. 10, 1979, 54-102448
Int. Cl.³ C12P *13/14*
U.S. Cl. 435—110 16 Claims

1. A method for producing L-glutamic acid by fermentation which comprises aerobically culturing in aqueous culture medium a mutant of the genus Brevibacterium or Corynebacterium of which ADP phosphorylation is less inhibited than its parent strain by ADP phosphorylation inhibition, and recovering L-glutamic acid accumulated in the resulting culture liquid, wherein the mutant is selected from the group consisting of:

Corynebacterium glutamicum NRRL B-12210
Brevibacterium lactofermentum NRRL B-12212
Brevibacterium lactofermentum NRRL B-12213
Brevibacterium flavum NRRL B-12204
Corynebacterium glutamicum NRRL B-12207
Brevibacterium lactofermentum NRRL B-12214
Brevibacterium lactofermentum NRRL B-12215
Brevibacterium flavum NRRL B-12205
Brevibacterium lactofermentum NRRL B-12216
Corynebacterium glutamicum NRRL B-12208
Brevibacterium lactofermentum NRRL B-12217
Brevibacterium lactofermentum NRRL B-12218
Brevibacterium flavum NRRL B-12206
Corynebacterium glutamicum NRRL B-12209.

4,347,318

METHOD FOR PRODUCING L-THREONINE BY FERMENTATION

Kiyoshi Miwa, Matsudo; Takayasu Tsuchida; Osamu Kurahashi, both of Kawasaki; Shigeru Nakamori, Yokohama; Konosuke Sano, Tokyo, and Haruo Momose, Kamakura, all of Japan, assignors to Ajinomoto Company, Incorporated, Tokyo, Japan

Filed Apr. 2, 1980, Ser. No. 136,475
Claims priority, application Japan, Apr. 2, 1979, 54-39617
Int. Cl.³ C12P *13/08*; C12N *15/00, 1/20*; C12R *1/19*
U.S. Cl. 435—115 4 Claims

1. A method for producing L-threonine by fermentation which comprises culturing in a culture medium an L-threonine producing microorganism wherein said microorganism is produced by incorporating into a recipient microorganism of the genus Escherichia which does not require L-threonine for growth, a plasmid, in which a deoxyribonucleic acid fragment which possesses genetic information relating to L-threonine synthesis obtained from a mutant resistant to α-amino-β-hydroxy valeric acid of the genus Escherichia, has been inserted.

4. A bacterium of the genus Escherichia which is Escherichia coli NRRL B-12100.

4,347,319

MICROBIOLOGICAL EPOXIDATION PROCESS

Ching-Tsang Hou; Ramesh N. Patel, both of Edison, N.J., and Allen I. Laskin, New York, N.Y., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 24,262, Mar. 27, 1979, abandoned, which is a continuation-in-part of Ser. No. 896,476, Apr. 14, 1978, abandoned. This application Oct. 24, 1980, Ser. No. 200,600
Int. Cl.³ C12P *17/02*
U.S. Cl. 435—123 10 Claims

1. A process for the epoxidation of a C_2–C_4 n-alkene, dienes or vinyl aromatic compounds which comprises: epoxidizing in a reaction medium said alkene, diene or vinyl aromatic compound, under aerobic conditions, in the presence of cells of a bacterial methylotrophic microorganism or any enzyme preparation prepared from said cells and exhibiting oxygenase enzyme activity until at least a portion of said corresponding epoxide is produced in isolable amounts, wherein said microorganisms have been aerobically grown in a nutrient medium containing methane and said microorganism are methane-utilizing micororganism strains selected from the group consisting of:

Methylosinum trichosporium	(CRL 15 PM1)	NRRL B-11,202
Methylosinus sporium	(CRL 16 PM2)	NRRL B-11,203
Methylocystic parvus	(CRL 18 PM4)	NRRL B-11,204
Methylomonas methanica	(CRL M4P)	NRRL B-11,205
Methylomonas methanica	(CRL 21 PM7)	NRRL B-11,206
Methylomonas albus	(CRL M8Y)	NRRL B-11,207
Methylomonas streptobacterium	(CRL 17 PM3)	NRRL B-11,208
Methylomonas agile	(CRL 22 PM9)	NRRL B-11,209
Methylomonas rubrum	(CRL M6P)	NRRL B-11,210
Methylomonas rubrum	(CRL 20 PM6)	NRRL B-11,211
Methylomonas rosaceus	(CRL M10P)	NRRL B-11,212
Methylomonas rosaceus	(CRL M7P)	NRRL B-11,213
Methylobacter chroococcum	(CRL M6)	NRRL B-11,214
Methylobacter chroococcum	(CRL 23, PM8)	NRRL B-11,215
Methylobacter bovis	(CRL M1Y)	NRRL B-11,216
Methylobacter bovis	(CRL 19 PM5)	NRRL B-11,217
Methylobacter vinelandii	(CRL M5Y)	NRRL B-11,218
Methylococcus capsulatus	(CRL M1)	NRRL B-11,219
Methylococcus minimus	(CRL 24 PM12)	NRRL B-11,220
Methylococcus capsulatus	(CRL 25 PM13)	NRRL B-11,221
Methylobacterium organophilum	(CRL 26 R6)	NRRL B-11,222

and mutants thereof.

4,347,320

IMMOBILIZATION OF MICROORGANISMS IN GELLED CARRAGEENAN

Gerald B. Borglum, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Nov. 24, 1980, Ser. No. 209,411
Int. Cl.³ C12P *7/48, 7/06*; C12N *11/10*
U.S. Cl. 435—144 6 Claims

1. A method of preparing immobilized viable *Aspergillus niger* or *Saccharomyces cerevisiae* microorganisms which comprises the steps of mixing said microorganisms with an aqueous solution of kappa-carrageenan at a temperature of about 25° to 50° C. and gelling the mixture by the addition of a compound selected from the group consisting of an epihalohydrin:alkylene polyamine polymer having a mole ratio of from about 0.60:1 to 2.7:1 and a molecular weight of from 4,000 to 50,000 and polyethyleneimine having a molecular weight of from 300 to 50,000 to form a gel matrix containing said immobilized viable microorganisms.

4,347,321

METHOD AND APPARATUS FOR PRODUCING ALCOHOL

Joseph E. Lionelle; Jeffrey A. Staffa, and William L. McCormick, all of Salida, Colo., assignors to Bio-Systems Research, Inc., Salida, Colo.

Filed Oct. 7, 1980, Ser. No. 194,850
Int. Cl.³ B01D *3/14*; C12M *1/00*; C12P *7/06*
U.S. Cl. 435—161 20 Claims

1. In a method of producing alcohol from fermentable material which comprises the steps of:

heating a mixture of water and a fermentable material to form a cooked mash;

fermenting the cooked mash to form a beer;

boiling the beer to produce a first vapor rich in alcohol;

partially condensing the first vapor to produce a liquid condensate and a second vapor further enriched in alcohol; and

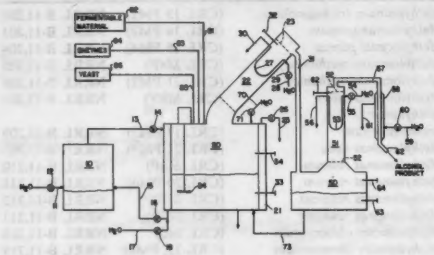
recovering an alcohol product from said second vapor;

the improvement wherein:

said steps of heating, fermenting, and boiling are carried out sequentially in a single vessel;

said liquid condensate is returned to said vessel;

said step of partially condensing said first vapor comprises passing said first vapor upwardly through a packed column and cooling the upper portion of said packed column; and



said step of recovering an alcohol product from said second vapor comprises passing said second vapor from the top of said packed column to a second vessel, partially condensing vapor from the top of said second vessel to produce a further liquid condensate and a third vapor enriched in alcohol, returning said further liquid condensate to said second vessel, and condensing said third vapor to form a liquid alcohol product.

4,347,322

CHROMATOGRAPHIC PROCESS FOR ENZYME PURIFICATION

Richard A. Johnson, and Norman E. Lloyd, both of Clinton, Iowa, assignors to Nabisco Brands, Inc., New York, N.Y.

Filed Jan. 12, 1981, Ser. No. 224,590

Int. Cl.³ C12N *11/12, 9/26, 9/92*

U.S. Cl. 435—179 **11 Claims**

1. A chromatographic process for producing a purified enzyme preparation comprising contacting an impure liquid enzyme preparation containing enzyme and soluble impurities with an ion exchange material known to adsorb the enzyme in a column wherein both the enzyme and the soluble impurities are adsorbed by the ion exchange material and adding an additional amount of the impure liquid enzyme preparation whereby the soluble impurities in the additional impure liquid enzyme preparation are preferentially adsorbed by the ion exchange material and the adsorbed enzyme is displaced from the ion exchange material thereby producing a purified liquid enzyme preparation substantially more concentrated than the impure liquid enzyme preparation.

4,347,323

GLYCEROL KINASE FROM *STREPTOMYCES CANUS*

Shigeyuki Imamura; Tohru Matsumoto; Naoki Muto, and Hideo Misaki, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed May 28, 1980, Ser. No. 154,029

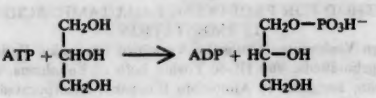
Claims priority, application Japan, Jun. 6, 1979, 54-71459

Int. Cl.³ C12N *9/12;* C12R *1/465;* C12Q *1/48*

U.S. Cl. 435—194 **2 Claims**

1. Glycerol kinase having the following properties:

(1) enzyme action: catalyzes at least the following reaction:



(2) molecular weight: 72000±7200

(3) isoelectric point: 4.5

(4) Km value:

glycerol	4.8×10^{-5}M
dihydroxyacetone	6.6×10^{-4}M
D-glyceraldehyde	3.5×10^{-4}M
ATP	2×10^{-4}M

(5) specificities for nucelotides: ATP>CTP>ITP>>GTP, UTP

(6) optimum pH: pH 9–10

(7) pH stability: pH 5.5–10

(8) effect of metal ions: stimulated by Mg++, inhibited by Ca++ and Mn++

(9) heat stability: stable up to 45° C.

2. A process for the production of glycerol kinase, which comprises culturing *Streptomyces canus* FERM-P No. 4977 in a nutrient medium containing carbon and nitrogen sources and inorganic salt, and then isolating the thus-produced glycerol kinase from the cultured medium.

4,347,324

PROCESS FOR ISOLATION OF PROTEINS FROM PLANT LEAVES

Samuel G. Wildman, Santa Monica, Calif., and Prachuab Kwanyuen, Gary, N.C., assignors to Leaf Proteins, Inc., Raleigh, N.C.

Continuation-in-part of Ser. No. 78,505, Sep. 24, 1979, Pat. No. 4,268,632. This application May 15, 1981, Ser. No. 264,116

Int. Cl.³ C12N *9/88*

U.S. Cl. 435—232 **24 Claims**

1. A process for obtaining ribulose 1,5-diphosphate carboxylase from plant material comprising the leaves of green plants which process comprises the steps:

(a) converting the leaves to a pulp comprising a mixture of a solid portion and a liquid portion, said liquid portion containing dissolved ribulose 1,5-diphosphate carboxylase;

(b) adjusting, if necessary, the pH of the liquid portion to within the range of pH 6.0 to a pH sufficiently above the isoelectric point of the proteins in the liquid portion that said proteins do not precipitate;

(c) separating the liquid portion from the solid portion; and

(d) storing said liquid portion at a temperature at which said ribulose 1,5-diphosphate carboxylase crystallizes.

4,347,325

POTASSIUM-ALUMINUM-PHOSPHATE COMPOSITIONS

Christian G. Michel, Ossining; Carolyn A. Ertell, Yonkers, and Johst H. Burk, Mohegan Lake, all of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Nov. 28, 1980, Ser. No. 210,906

Int. Cl.³ C04B *1/00*

U.S. Cl. 501—1 **89 Claims**

1. A solid potassium-aluminum-phosphate composition of matter having the nominal formula:

$$(K_2O)_x(Al_2O_3)_y(P_2O_5)_8(H_2O)_n$$

wherein x represents a number ranging from about 0.3 to about 2, y represents a number ranging from about 3 to about 15 and n represents a number ranging up to about 100; comprising a hydrated oxide of aluminum and at least one potassium-

aluminum-phosphate species selected from the group consisting of:

$KAl_3H_8(PO_4)_6.6H_2O$

$KAl_3H_{14}(PO_4)_8.4H_2O$ and

$K_3Al_5H_6(PO_4)_8.18H_2O$

self-bound into a solid mass.

4,347,326

FOAMABLE GLASS COMPOSITION AND GLASS FOAM

Isamu Iwami, Zushi; Shingo Kimura, Yokohama, and Toshio Iwasa, Tokyo, all of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Mar. 11, 1981, Ser. No. 242,547
Claims priority, application Japan, Mar. 17, 1980, 55/32654; Mar. 17, 1980, 55/32655; Dec. 3, 1980, 55/169674
Int. Cl.³ C03C *11/00, 3/04, 3/08, 3/10*
U.S. Cl. 501—39 16 Claims

1. A foamable glass composition consisting essentially of 100 parts by weight of anhydrous modified sodium silicate glass and 0.5 to 4 parts by weight of calcium carbonate ($CaCO_3$) as foaming agent, wherein the composition of anhydrous modified sodium silicate glass is

$Na_2O.xSiO_2$ ($x = 3$ to 3.8)	75 to 95 wt. %
Modifier CaO	5 to 15 wt. %
Modifier MO	0 to 10 wt. %

(M: boron or metal other than sodium and calcium).

7. A foam produced by foaming the foamable glass composition of claim 1 of which cell wall is made of oxides in the composition as designated below, and wherein the content of CO_2 in the gas components existing in the cell is not less than 50 vol.%

$54.6 \leqq SiO_2 \leqq 74.5\%$

$15.7 \leqq Na_2O \leqq 24.2\%$

$5.3 \leqq CaO \leqq 17.2\%$

$0 \leqq MO \leqq 10.0\%$

(M: boron or metal other than sodium and calcium).

4,347,327

RECOVERY OF LITHIUM FROM BRINES

John M. Lee, and William C. Bauman, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 939,545, Sep. 5, 1978, Pat. No. 4,221,767, which is a division of Ser. No. 812,534, Jul. 5, 1977, Pat. No. 4,116,856. This application Nov. 19, 1979, Ser. No. 95,692
Int. Cl.³ C08D *5/20*
U.S. Cl. 521—28 9 Claims

1. A particulate anion exchange resin having suspended therein a microcrystalline $LiOH.2Al(OH)_3$ structure.

4,347,328

ANTI-CLUMPING OF ION EXCHANGE RESINS

Zita T. K. Harmon, and Lowell B. Lindy, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 8, 1980, Ser. No. 185,083
Int. Cl.³ B01J *39/18, 41/12*
U.S. Cl. 521—28 14 Claims

1. A method for reducing the clumping or interaction exhibited between cation and anion exchange resins in a resin bed comprising a mixture of cation and anion exchange resins, said method comprising the step of contacting the cation or anion resin prior, during or subsequent to the formation of the mixed resin bed with an aqueous dispersion of water-insoluble polymer particles having a number average particle size from about 100 to about 800 Å and bearing a moiety having an opposite ionic character than the cation or anion resin being treated, wherein the water-insoluble polymer particles are employed in an amount sufficient to reduce the clumping or interaction of the cation and anion resins but less than an amount which significantly affects the ion-exchange kinetics of the treated cation or anion resin.

4,347,329

EXPANDABLE POLYOLEFIN COMPOSITIONS AND POLYOLEFIN FOAM PREPARATION PROCESS

Chung P. Park, Pickerington, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed May 29, 1980, Ser. No. 154,332
Int. Cl.³ C08J *9/14*
U.S. Cl. 521—79 20 Claims

1. A process for preparing closed-cell olefin polymer foamed articles having increased maximum achievable cross-sectional areas and having good dimensional stability which process comprises the steps of:

(A) heat plastifying a normally solid olefin polymer resin selected from the group consisting of ethylene homopolymers and substantially non-neutralized ethylenic copolymers derived from at least about 50 weight percent of ethylene;

(B) admixing said heat plastified resin under elevated temperature and pressure with

(1) a stability control agent selected from the group consisting of partial esters of long-chain fatty acids with polyols, higher alkyl amines, fatty acid amides, complete esters of higher fatty acids, and substantially non-neutralized a-olefin-monoethylenically unsaturated carboxylic acid copolymers and

(2) a mixed blowing agent

(a) which comprises from about 50 to about 95 weight percent of dichlorodifluoromethane and from about 5 to about 50 weight percent of an aliphatic hydrocarbon compound or a halogenated hydrocarbon compound having a normal atmospheric boiling point of from about 0° C. to about 50° C., and

(b) which has a saturated vapor pressure at 100° C. of less than about 32 kg/cm^2 but greater than about 25 kg/cm^2; and

(C) extruding the resultant mixture into a zone of lower temperature and pressure to thereby form said olefin polymer foam.

4,347,330

LOW-COST SURFACTANT COMPOSITIONS FOR HIGH RESILIENCY FLEXIBLE FOAMS

John G. Demou, Lincoln Park; Edward R. Pray, Dearborn, and Robert L. McBrayer, Lincoln Park, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Sep. 8, 1981, Ser. No. 300,048
Int. Cl.³ C08G *18/14*
U.S. Cl. 521—110 14 Claims

1. The method for improving cell structure with little or no shrinkage or foam collapse in molded high resilience open celled flexible polyurethane foams prepared by the reaction of an organic polyol having a hydroxyl functionality of at least 2 with an organic polyisocyanate in the presence of a blowing agent, said method comprising incorporating with the reactants three cell modifiers consisting of a polysiloxane-polyoxyalkylene copolymer, a polymethylsiloxane, and a polyether polyol cell modifier containing polyoxyethylene groups in amount of at least about 80 percent by weight of said polyether polyol.

4,347,331

FOAMED, LOW DENSITY, HIGHLY EXTENDED UNSATURATED POLYESTER RESIN SYRUP COMPOSITION, A SHAPED ARTICLE COMPRISED OF THE COMPOSITION AND A PROCESS FOR PREPARING SUCH ARTICLE

James M. Self, Taylor, S.C., assignor to Tanner Chemical Company, Inc., S.C.

Continuation-in-part of Ser. No. 191,134, Sep. 26, 1980, abandoned. This application Jul. 9, 1981, Ser. No. 281,726

Int. Cl.³ C08J 9/00

U.S. Cl. 521—119 33 Claims

1. A foamed, low density, highly extended, polymerized unsaturated polyester resin syrup product comprising:

(a) polymerized unsaturated polyester resin syrup; and

(b) the reaction product of aqueous aluminum hydroxie chloride solution and reactive, non-reinforcing, extender material capable of providing a blowing agent which is selected from the group consisting of inorganic carbonate compounds, inorganic bicarbonate compounds and mixtures thereof,

wherein the original weight ratio of the sum of the reactive, non-reinforcing, extender material and the aqueous aluminum hydroxie chloride solution to the unsaturated polyester resin syrup is from about 0.5:1.0 to about 10.0:1.0 and the original weight ratio of the reactive, non-reinforcing, extender material to the aqueous aluminum hydroxie chloride solution is less than about 5.0:1.0.

4,347,332

POLYAMIDE/POLYETHYLENE COPOLYMER FILM AND METHOD FOR PRODUCING

Thomas W. Odorzynski, Green Bay, and Jack E. Knott, II, Appleton, both of Wis., assignors to American Can Company, Greenwich, Conn.

Filed Apr. 1, 1981, Ser. No. 249,974

Claims priority, application United Kingdom, Jun. 19, 1980, 8020135

Int. Cl.³ C08K 5/36

U.S. Cl. 524—169 9 Claims

1. In a method for the production of a film having relatively high levels of strength and toughness and good oxygen barrier properties, the steps comprising:

a. forming a blend of about 90 to 20 weight percent of a film-forming polyamide resin having a molecular weight of about 20,000 to 30,000 and a melting point temperature of about 415 degrees to 440 degrees Fahrenheit, conversely about 10 to 80 weight percent of an ethylene vinyl alcohol copolymer having a molecular weight of about 15,000 to 30,000 and a melting point temperature of about 325 degrees to 375 degrees Fahrenheit, and about 2 to 25 percent, based upon the weight of said polyamide resin, of a plasticizer therefor, said plasticizer being effective to lower the processing temperature of said polyamide resin to a value approximately that of said copolymer and below the temperature at which any sustantial amount of degradation would occur therein under appropriate conditions for extrusion;

b. heating said blend to said processing temperature;

c. forcing said blend through an extrusion die to produce a film of said blend; and

d. cooling said film to obtain a product having such desirable levels of toughness and oxygen barrier capability.

4,347,333

EMULSION COATING COMPOSITION CONTAINING SILICONE AND ACRYLIC POLYMER

Robert H. Lohr, Union Grove, and Lee W. Morgan, Racine, both of Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Jun. 16, 1980, Ser. No. 159,723

Int. Cl.³ C08J 3/00

U.S. Cl. 524—269 11 Claims

1. An emulsion hard surface coating composition comprising:

(a) At least one solvent of (i) a poor hydrogen bonding solvent the solubility parameter of the solvent being from about 6.0 to 8.2 or (ii) a moderate hydrogen bonding solvent, the solubility parameter of the solvent being from about 6.0 to 7.5;

(b) Water;

(c) From about 0.5 to % by weight of at least one surfactant;

(d) From 0 to about 20% by weight of an abrasive;

(e) From about 3 to 15% by weight of at least one silicone;

(f) From 0 to about 10% by weight of a wax; and

(g) From about 0.5 to 3% by weight of an acrylic polymer which has an M_n of greater than about 3000 and is soluble in said solvent,

with the proviso that: (i) if the emulsion is an oil-in-water emulsion, then the solvent is present in an amount of from about 5–65% by weight and the water is present in an amount of from about 15 to 90% by weight; or (ii) if the emulsion is a water-in-oil emulsion, then the solvent is present in an amount of from about 15–90% by weight and the water is present in an amount of from about 5 to 65% by weight.

4,347,334

PARTICULATE AGENT FOR IMPEDING THE COMBUSTIBILITY OF COMBUSTIBLE SUBSTANCES

Horst Staendeke; Franz-Josef Dany, and Joachim Kandler, all of Erftstadt, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 4, 1981, Ser. No. 231,377

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1980, 3005252

Int. Cl.³ C08K 3/32

U.S. Cl. 524—416 7 Claims

1. Particulate agent, for impeding the combustibility of combustible substances, based on a free-flowing pulverulent ammonium polyphosphate of the general formula:

$$H_{(n-m)+2}(NH_4)_mP_nO_{3n+1}$$

in which n stands for a whole number with an average value of about 20 to 800 and the ratio m/n is about 1, and a phenol resin, the agent containing:

(a) about 75 to 99.9 weight % of the free-flowing pulverulent ammonium polyphosphate, and

(b) about 0.1 to 25 weight % of a hardened, water-insoluble phenol resin enveloping the individual ammonium polyphosphate particles.

4,347,335

HIGH BOND STRENGTH AQUEOUS PHENOL MODIFIED POLYESTER COATING COMPOSITION

Charles H. Thomas, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 19, 1981, Ser. No. 226,339

Int. Cl.³ C09D 3/52, 3/56, 3/66

U.S. Cl. 524—538 9 Claims

1. A water reducible composition, comprising:

(I) a polyester resin consisting essentially of the reaction product of: (a) an organic dicarboxylic acid selected from the group consisting of aromatic dicarboxylic acids, tetrahydrophthalic acid, and mixtures thereof; (b) an organic compound selected from tris(2 hydroxy alkyl)isocyanurate, where the alkyl group contains from 2 to 6 carbon

atoms, and organic polyhydric alcohols containing more than two hydroxyl groups per molecule, and mixtures thereof; (c) saturated fatty acid, and (d) tricarboxylic acid; and

(II) additive consisting essentially of: (a) 8 wt.% to 30 wt.%, based on 100% polyester solids, of an aqueous solution of a water soluble, unmodified phenol-formaldehyde resin having an average molecular weight of below about 275; and (b) 20 wt.% to 55 wt.%, based on the polyester solids, of water soluble aminoplast selected from the group consisting of urea-formaldehyde condensation products and melamine-formaldehyde condensation products, to provide a water reducible composition; where the composition is free of saturated aliphatic dicarboxylic acid and saturated aliphatic dihydric alcohol reactants.

4,347,336

HEAT CURED SILICONE ELASTOMER

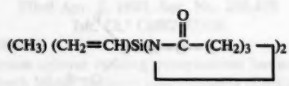
Gary R. Homan, and Charles A. Romig, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Oct. 13, 1981, Ser. No. 310,025
Int. Cl.³ C08L *83/04*
U.S. Cl. 524—731 12 Claims

1. A composition comprising the product obtained by mixing, in the absence of moisture,

(A) 100 parts by weight of hydroxyl endblocked polydiorganosiloxane having a viscosity of from 0.07 to 50 Pa.s at 25° C. wherein each organic radical is selected from a group consisting of methyl, ethyl, vinyl, phenyl, and 3,3,3-trifluoropropyl radicals, there being from 0 to 2 inclusive percent vinyl radicals, from 0 to 50 inclusive percent 3,3,3-trifluoropropyl radicals, and from 0 to 30 percent inclusive phenyl radicals, all percents based on the total number of organic radicals in the polydiorganosiloxane;

(B) sufficient



to give from 0.9 to 1.1 moles of (B) for each two moles of hydroxyl radical in (A), and

(C) 0.1 to 5 parts by weight of organic peroxide.

4,347,337

ETHYLENE-VINYL ALCOHOL WITH PHENOL ADDITIVE

Jack E. Knott, II, Appleton, Wis., assignor to American Can Company, Greenwich, Conn.

Division of Ser. No. 130,229, Mar. 14, 1980, Pat. No. 4,289,830.
This application Apr. 3, 1981, Ser. No. 250,844
Int. Cl.³ C08F *8/00, 16/06;* C08K *5/13*
U.S. Cl. 525—60 1 Claim

1. A method for decreasing the gas permeability in the presence of moisture of an ethylene-vinyl alcohol polymer gas-barrier layer comprising the step of adding at least about one percent of an ortho-substituted phenol having a melting point below about 185° C. and a boiling point above about 125° C. to the polymer before forming the barrier layer.

4,347,338

PROCESS FOR PREPARING THERMOSETTABLE POLYURETHANE WHICH COMPRISES BLENDING A POLYISOCYANATE WITH A FIRST THERMOPLASTIC RESIN AND THEN BLENDING WITH A SECOND THERMOPLASTIC RESIN WHICH IS A POLYURETHANE

Hideyasu Torii, Kawagoe, and Susumu Nakamura, Kawaguchi, both of Japan, assignors to Dainichiseika Color & Chemicals Mfg. Co., Ltd. and Ukima Colour & Chemicals Mfg. Co., Ltd., both of Tokyo, Japan

Filed May 19, 1981, Ser. No. 265,244
Claims priority, application Japan, May 29, 1980, 55-70860
Int. Cl.³ C08L *75/04*
U.S. Cl. 525—123 5 Claims

1. A process for preparing a thermosettable polyurethane product which comprises blending a compound having two or more terminal isocyanate groups with a thermoplastic resin which is inert to an isocyanate group to prepare an isocyanate compound batch and further blending the isocyanate compound batch with a thermoplastic polyurethane resin and fabricating the resulting mixture.

4,347,339

CATIONIC BLOCK COPOLYMERS

Jan E. Boevink, Malabar; Arthur P. Derrick, Sylvania, both of Australia, and John A. Moodie, Lisle, Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed May 8, 1981, Ser. No. 261,827
Int. Cl.³ C08L *39/04, 57/12, 71/02, 77/06*
U.S. Cl. 525—180 33 Claims

1. A method of manufacture of a water soluble cationic block copolymer comprising the steps of:

selecting at least one first polymeric species having amino groups in the polymeric structure thereof wherein a majority of the amino groups are quaternary,

selecting at least one second polymeric species having amino groups in the polymeric structure thereof wherein a majority of the amino groups are other than quaternary amino groups, and

interlinking said selected first and said selected second polymer species to form a block copolymer.

4,347,340

METHOD FOR PREPARING THERMOELASTOMERIC THREE-BLOCK COPOLYMERS

Paolo Giusti, Pisa, Italy, assignor to Anic, S.p.A., Palermo, Italy

Filed Apr. 6, 1981, Ser. No. 250,925
Claims priority, application Italy, Apr. 10, 1980, 21290 A/80
Int. Cl.³ C08F *297/04*
U.S. Cl. 525—249 11 Claims

1. A process for the preparation of three-block copolymers of the ABA or the ABC type wherein the blocks A and C are of a plastomeric nature and the block B is of an elastomeric nature, comprising the steps of effecting the sequential polymerization of the monomers relative to the first plastomeric block, the elastomeric block and the second plastomeric block in the order given, in the presence of a catalytic system comprised of:

(a) a compound of aluminum having the formula AlR_2X', wherein both the radicals R are hydrogen atoms, or alkyl radicals, equal or different, containing up to 8 carbon atoms, and X' is an atom of fluorine, chlorine, bromine or iodine, or a radical containing up to 8 carbon atoms, and

(b) a compound selected from the group consisting of:

(1) X_2'' wherein X'' is a halogen equal to, or different from, X';

(2) X''X''' wherein X'' is a halogen as defined above and X''' is a halogen other than X'', and

(3) a group

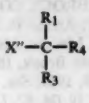
wherein

X″ is a halogen,

R_1 is a member selected from the group consisting of hydrogen, an alkyl radical containing from 1 to 8 carbon atoms, an aromatic radical, an alkenyl radical containing from 2 to 8 carbon atoms,

R_3 is a member selected from the group consisting of hydrogen, an alkyl radical containing from 1 to 8 carbon atoms, an aromatic radical, an alkenyl radical containing from 2 to 8 carbon atoms, and an aralkyl radical, and

R_2 is a member selected from the group consisting of an alkyl radical containing from 1 to 8 carbon atoms, an alkenyl radical containing from 2 to 8 carbon atoms, an aromatic radical, an aralkyl radical, an alkaryl radical, a cycloalkyl radical containing from 3 to 10 carbon atoms, and a group



wherein R_1, R_3 and X″ are as hereinbefore defined and R_4 is a member selected from the group consisting of an aromatic radical, an aralkyl radical and a methylene chain $-(CH_2)_n-$ wherein n is an integer comprised between 1 and 10.

4,347,341

PROCESS FOR THE PRODUCTION OF ETHYLENE GRAFT COPOLYMERS CONTAINING ANHYDRIDE OR CARBOXYL GROUPS

Herbert Bartl, Odenthal, and Klaus Schuster, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 24, 1981, Ser. No. 295,642

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1980, 3033001

Int. Cl.³ C08F *263/04, 255/02*

U.S. Cl. 525—267 **7 Claims**

1. A process for the production of ethylene graft copolymers containing anhydride or carboxyl groups in homogeneous or heterogeneous phase in an organic solvent, wherein

(A) from 5 to 70% by weight of a monomer mixture of:

(a) from 10 to 70% by weight of a vinyl ester of an aliphatic C_1–C_{18}-monocarboxylic acid; and

(b) from 90 to 30% by weight of maleic acid anhydride, its C_1–C_{20}-alkyl semiesters or mixtures thereof;

are radically polymerised in the presence of

(B) from 95 to 30% by weight of an ethylene homopolymer or an ethylene/vinyl ester copolymer containing from 5 to 70% by weight of copolymerised units of a vinyl ester of an aliphatic C_1–C_{18}-monocarboxylic acid as the graft substrate in tert.-butanol or methylene chloride, the sum total of (A) and (B) and the sum total of (a) and (b) each a mounting to 100% by weight.

4,347,342

PROCESS FOR INITIATING RADICAL REACTIONS EMPLOYING HYDROXIMIC ACID DERIVATIVES

Jan D. Van Drumpt, Deventer, and Wilhelmus M. Beijleveld, Olst, both of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

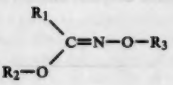
Filed Feb. 20, 1981, Ser. No. 236,342

Claims priority, application Netherlands, Feb. 29, 1980, 8001231

Int. Cl.³ C08G *17/14*; C08F *27/00*

U.S. Cl. 525—374 **19 Claims**

1. In an improved process for initiating radical reactions, the improvement comprises employing as an initiator a compound of the formula

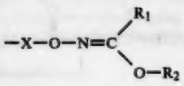


wherein

R_1 is selected from the class consisting of substituted or unsubstituted: C_1–C_{22} alkyl, C_2–C_{22} alkenyl, C_6–C_{20} cyclohexyl, C_6–C_{20} phenyl and C_7–C_{20} aralkyl;

R_2 is selected from the class consisting of substituted or unsubstituted: C_1–C_{20} alkyl, C_2–C_{20} alkenyl, C_6–C_{20} cyclohexyl, C_6–C_{20} phenyl, C_7–C_{20} aralkyl, C_2–C_{21} alkylcarbonyl, C_3–C_{21} alkenylcarbonyl, C_7–C_{21} cyclohexylcarbonyl, C_7–C_{21} phenylcarbonyl, C_8–C_{21} aralkylcarbonyl, C_7–C_{21} alkoxycarbonyl, C_3–C_{21} alkenyloxycarbonyl, C_7–C_{21} cyclohexyloxycarbonyl, C_7–C_{21} phenoxycarbonyl and C_8–C_{21} aralkyloxycarbonyl; and

R_3 is hydrogen, a group selected from the class consisting of substituted or unsubstituted: C_1–C_{20} alkyl, C_2–C_{20} alkenyl, C_6–C_{20} cyclohexyl, C_6–C_{20} phenyl, C_7–C_{20} aralkyl, C_2–C_{21} alkylcarbonyl, C_3–C_{21} alkenylcarbonyl C_7–C_{21} cyclohexylcarbonyl, C_7–C_{21} phenylcarbonyl, C_8–C_{21} aralkylcarbonyl, C_7–C_{21} alkoxycarbonyl, C_3–C_{21} alkenyloxycarbonyl, C_7–C_{21} cyclohexyloxycarbonyl, C_7–C_{21} phenyloxycarbonyl and C_8–C_{21} aralkyloxycarbonyl; a



group wherein X is substituted or unsubstituted: C_1–C_{12} alkylene, C_2–C_{12} alkenylene, C_6–C_{12} cycloalkylene or phenylene; or a $-SO_2Y$ group wherein Y is substituted or unsubstituted: C_1–C_{20} alkyl, C_6–C_{20} cycloalkyl or phenyl.

4,347,343

THICKENED VINYL ESTER RESIN COMPOSITIONS

James L. Brewbaker, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 21, 1981, Ser. No. 226,963

Int. Cl.³ C08L *63/00*

U.S. Cl. 525—530 **12 Claims**

1. A curable polymer composition capable of being B-staged with the addition of magnesium oxide, said composition comprising (1) a curable resin having no free carboxyl groups and which is the reaction product of about equivalent amounts of an unsaturated monocarboxylic acid and a polyglycidyl ether, 2) a reactive diluent and (3) a thickening agent which is a polyether having terminal carboxyl groups and repeating groups consisting essentially of ethoxy moieties, said polyether being, the reaction product of a polyethylene oxide having a molecular weight greater than about 4,500 and the anhydride of a polycarboxylic acid, said thickening agent having more than two carboxyl groups per molecule.

4,347,344

ORIENTED P-METHYL STYRENE POLYMER

S. Christine Ong, Somerville, and Margaret N. Bright, Jamesburg, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 24, 1980, Ser. No. 190,535
Int. Cl.³ C08F 12/12
U.S. Cl. 526—347.1 5 Claims

1. A biaxially-oriented film consisting essentially of a layer of solid thermoplastic methyl styrene polymer, said polymer having at least 90 percent repeating units of 4-methylstyrene.

4,347,345

PROCESS FOR THE PRODUCTION OF BROKEN-DOWN ORGANIC LIGNIN-CELLULOSE SILICATE POLYMERS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Division of Ser. No. 257,126, Apr. 24, 1981, Pat. No. 4,313,857, which is a division of Ser. No. 203,730, Nov. 3, 1980, which is a continuation-in-part of Ser. No. 112,290, Jan. 15, 1980, Pat. No. 4,220,757, which is a continuation-in-part of Ser. No. 29,202, Apr. 12, 1979, Pat. No. 4,220,757. This application Nov. 9, 1981, Ser. No. 319,210
Int. Cl.³ C08B 31/00
U.S. Cl. 527—301 20 Claims

1. The process for the production of a polyurethane silicate product by mixing and reacting a broken-down alkali metal lignin-cellulose silicate polymer and a substituted organic compound having a substituent which will split off during the reaction to said broken-down alkali metal lignin-cellulose silicate polymer in the amount wherein the mols of the substituted radicals are about equal to the mols of the alkali radicals in the mixture thereby producing a broken-down organic lignin-cellulose silicate polymer then 1 to 95 parts by weight of the broken-down organic lignin-cellulose silicate polymer and 50 parts by weight of a polyisocyanate or a polyisothiocyanate are mixed and reacted thereby producing a polyurethane silicate product.

4,347,346

SILICONE RELEASE COATINGS AND INHIBITORS

Richard P. Eckberg, Round Lake, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Apr. 2, 1981, Ser. No. 250,479
Int. Cl.³ C08G 77/06
U.S. Cl. 528—15 19 Claims

1. A silicone release coating composition having improved catalyzed bath life at ambient temperatures comprised of:

a. an olefinorganopolysiloxane having units of the structural formula

$$R_aR'_bSiO_{\frac{4-a-b}{2}}$$

b. an organohydrogenpolysiloxane having units of the structural formula

$$R_aH_bSiO_{\frac{4-a-b}{2}}$$

wherein R is selected from the group consisting of a monovalent hydrocarbon radical, a halogenated monovalent hydrocarbon radical, a cyanoalkyl radical and mixtures thereof, R' is an olefinic hydrocarbon radical, wherein a has a value of from 0 to 3, inclusive, b has a value of from 0.005 to 2.0, inclusive, and the sum of a and b is equal to from 0.8 to 3, inclusive;

c. a sufficient amount of a precious metal catalyst to cause the co-reaction of (a) and (b); and

d. a dialkylacetylenedicarboxylate having the general formula

ROOCC≡CCOOR

where R is as defined above and wherein said dialkylacetylenedicarboxylate is present in an amount effective for inhibiting premature gelation but insufficient for preventing cure at elevated temperature; wherein said silicone release coating composition has a viscosity of, approximately, 25 to 5000 centipoise at 25° C.

4,347,347

CROSSLINKED ORGANOMETALLIC BLOCK COPOLYMERS AND PROCESS FOR PRODUCTION THEREOF

Seishi Yajima; Kiyohito Okamura; Yoshio Hasegawa, and Takemi Yamamura, all of Oharai, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Jun. 18, 1980, Ser. No. 160,516
Claims priority, application Japan, Jun. 28, 1979, 54-80792; Mar. 21, 1980, 54-34909
Int. Cl.³ C08G 77/60, 77/54
U.S. Cl. 528—30 3 Claims

1. An organometallic copolymer having a number average molecular weight of about 1000 to about 50000 composed of (A) a polycarbosilane portion with a number average molecular weight of about 500 to about 10000 having a main chain skeleton composed mainly of carbosilane units of the formula $-(-Si-CH_2-)-$ and (B) a polymetallosiloxane portion with a number average molecular weight of about 500 to about 10000 having a main chain skeleton composed of metalloxane units of the formula $-(-M-O-)-$ wherein M represents a metal atom selected from the group consisting of Ti and Zr and siloxane units of the formula $-(-Si-O-)-$; each silicon atom of said carbosilane units having bonded thereto a side-chain group selected from the group consisting of hydrogen, lower alkyl and phenyl, most of the metal atoms M in said metalloxane units having bonded thereto a side-chain group selected from the group consisting of lower alkoxy, phenoxy and acetylacetoxy, most of the silicon atoms of said siloxane units having bonded thereto a side-chain group selected from the group consisting of alkyl and phenyl, the ratio of the total number of said metalloxane units to that of said siloxane units being in the range of from about 30:1 to about 1:30, the ratio of the total number of said carbosilane units to the sum of the total number of said metalloxane units and the total number of said siloxane units being in the range of about 100:1 to about 1:100, and at least some of the silicon atoms of said polycarbosilane portion (A) being bonded through oxygen to at least some of the metal atoms M and/or silicon atoms of said polymetallosiloxane portion (B) whereby the polycarbosilane portion (A) is crosslinked with the polymetallosiloxane portion (B).

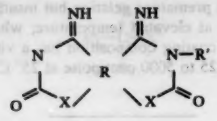
4,347,348

HEAT-RESISTANT HETEROCYCLIC POLYMERS AND METHODS FOR PRODUCING SAME

Alexei Y. Chernikhov, prospekt Vernadskogo, 93, kv. 64; Mikhail N. Yakovlev, ulitsa Amurskaya, 8, kv. 93, both of Moscow; Valentina B. Lysova, Pavlovsky posad, ulitsa Juzhnaya, 22, kv. 59, Moskovskaya oblast; Evgeny L. Gefter, B. Dorogomilovskaya ulitsa, 56, kv. 60, and Nina N. Shmagina, ulitsa Moldogulovoi, 8, korpus 1, kv. 66, both of Moscow, all of U.S.S.R.

Continuation of Ser. No. 912,541, Jun. 5, 1978, abandoned. This application Jun. 20, 1980, Ser. No. 161,381
The portion of the term of this patent subsequent to Oct. 21, 1997, has been disclaimed.
Int. Cl.³ C08G 18/18, 18/77, 18/78
U.S. Cl. 528—51 8 Claims

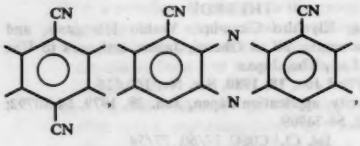
1. Heat-resistant heterocyclic polymers of the formula:

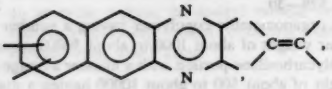


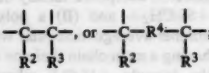
wherein

X is NH or O;

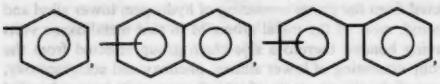
R is

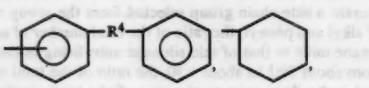


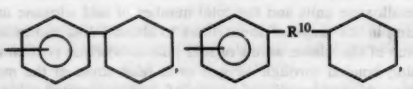


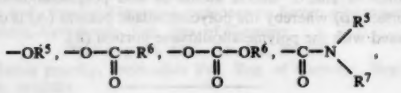


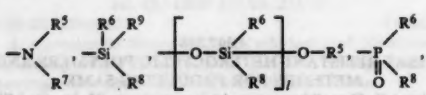
R^2 and R^3=H, C_fH_{2f+1}, C_fH_{2f-1},

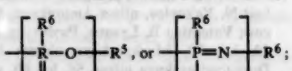




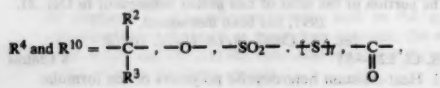








R^4 and R^{10}=



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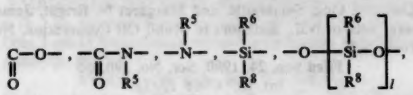
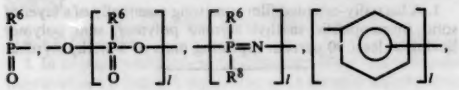
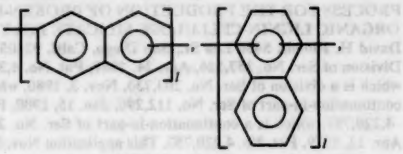
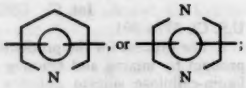
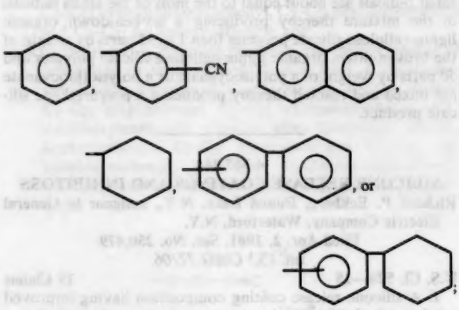




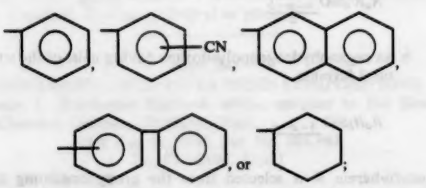




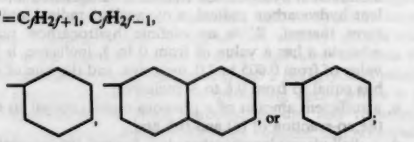
R^5 and R^7 are the same or different and=H, C_fH_{2f+1}, C_fH_{2f-1},



R^6 and R^8 are the same or different and=C_fH_{2f+1}, C_fH_{2f-1},



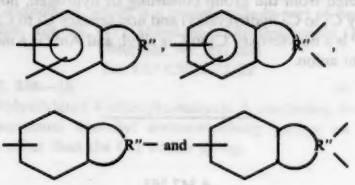
R^9=C_fH_{2f+1}, C_fH_{2f-1},



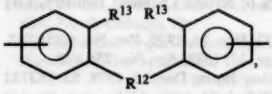
f=1-5, l=1-1000,

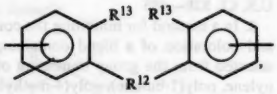
R also being an organic radical comprising at least one saturated or unsaturated hydrocarbon pentatomic cycle; a penta-

tomic heterocycle comprising at least one atom selected from the group consisting of nitrogen, sulfur and oxygen; a cyclic compound of boron and phosphorus or boron or phosphorus, an aromatic radical comprising halogen atoms connected directly to the aromatic fragment; a halogen-containing aliphatic radical of 2–1000 carbon atoms; an aromatic nitrile-containing radical with a nitrile group in meta position an amino or hydroxy group; an organic residue comprising at least one fragment selected from the group consisting of



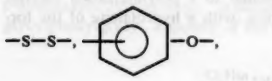
wherein R^{11} is an organic radical containing 3 to 8 atoms selected from the group consisting of carbon, nitrogen and sulfur: a radical of the structure:

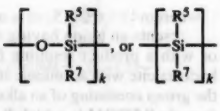




wherein

R^{12}=—NH—CO—NH—, —NH—CO—, —NH—CO—O—, —CH=N—, R^{13}=H, CN,





K=5–100, and

wherein R′ is an organic radical of 2–1000 carbon atoms; a radical of 2–1000 carbon atoms and including at least one of the elements silicon, fluorine, chlorine, bromine, nitrogen, phosphorus, boron, and oxygen, each of said elements being in an amount of 1 to 1000 atoms.

4,347,349

AROMATIC POLYESTER AND FILAMENTS

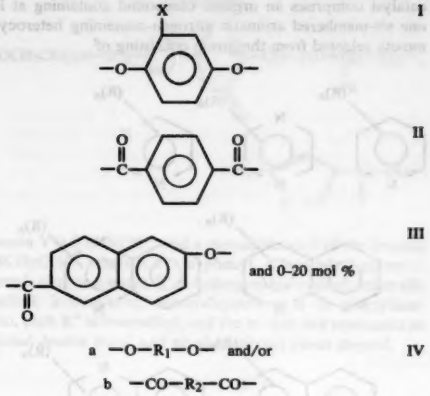
Roger K. Siemionko, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 28, 1980, Ser. No. 173,099

Int. Cl.³ C08G 63/06

U.S. Cl. 528—190 **12 Claims**

1. Polyesters of fiber-forming molecular weight consisting essentially of units having the following structural formulas:



wherein X is chloro- or methyl, and wherein unit 4a is a dioxy unit derived from hydroquinone, resorcinol, 2,5- or 2,6-dichlorohydroquinone, and unit IVb is isophthaloyl, in the proportions of about 75 to 95 mol % of Units I and II and about 5–25 mol % of Units III and IV of which at least 5 mol % is Unit III, the dioxy units and the dicarbonyl units in the polymer are substantially equimolar in quantity.

4,347,350

POLYESTER COMPOSITIONS CONTAINING RESIDUES OF DIHYDROXYALKOXY COUMARINS

Patrick J. Horner, Welwyn Garden City, and Robert B. Rashbrook, Hatfield, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 28, 1980, Ser. No. 210,755

Claims priority, application United Kingdom, Dec. 10, 1979, 7942481

Int. Cl.³ C08G 63/66

U.S. Cl. 528—190 **7 Claims**

1. A linear polyester which contains in its molecule esterification residues of di(hydroxyalkoxy)coumarins selected from the group consisting of 6,7-di(hydroxyalkoxy)-coumarin, 7,8-di-(hydroxyalkoxy)-coumarin, 5,7-di(hydroxyalkoxy)-coumarin, 4-methyl-6,7-di(hydroxyalkoxy)-coumarin, 4-methyl-7,8-di(hydroxyalkoxy)-coumarin and 4-methyl-5,7-di(hydroxyalkoxy)-coumarin, the amount of said residues being 0.05 to 10% by weight based on the total polymer.

4,347,351

LINEAR POLYESTERS FROM AROMATIC DICARBOXYLIC ACIDS AND CYCLIC ALKYLENE CARBONATES PREPARED USING SIX-MEMBERED AROMATIC NITROGEN-CONTAINING HETEROCYCLIC GROUPS

Daniel J. Swart, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

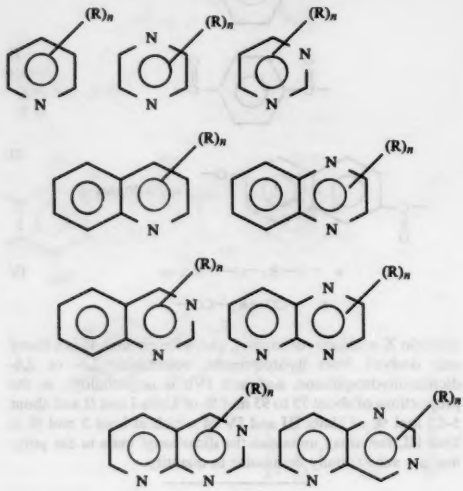
Continuation-in-part of Ser. No. 112,007, Jan. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 35,171, May 2, 1979, abandoned. This application Feb. 17, 1981, Ser. No. 235,075

Int. Cl.³ C08G 63/62

U.S. Cl. 528—271 **8 Claims**

1. In the process for forming linear polyesters from an aromatic dicarboxylic acid and a cyclic alkylene carbonate, said process comprising reacting by contacting an aromatic dicarboxylic acid with a cyclic alkylene carbonate in a molar ratio of dicarboxylic acid to cyclic alkylene carbonate of from about 1:1 to about 1:4 at a temperature from about 145° C. to about 260° C. in the presence of a catalytic amount of a catalyst,

followed by polycondensation, the improvement wherein the catalyst comprises an organic compound containing at least one six-membered aromatic nitrogen-containing heterocyclic moiety selected from the group consisting of



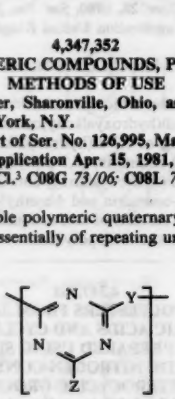
wherein R is amino, phenyl, or a radical containing up to 4 carbons selected from alkyl, alkylamino, dialkylamino and alkoxyalkyl; and n is one or two.

4,347,352
NOVEL POLYMERIC COMPOUNDS, PROCESSES AND METHODS OF USE

Eugene P. Wesseler, Sharonville, Ohio, assignor to Sterling Drug Inc., New York, N.Y.

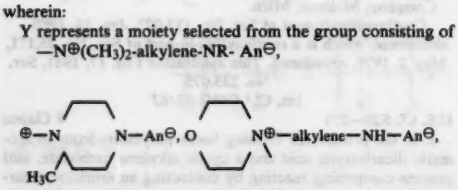
Continuation-in-part of Ser. No. 126,995, Mar. 3, 1980, Pat. No. 4,314,001. This application Apr. 15, 1981, Ser. No. 254,501
Int. Cl.³ C08G 73/06; C08L 79/04
U.S. Cl. 528—423 **29 Claims**

1. A water-soluble polymeric quaternary ammonium compound consisting essentially of repeating units of the formula



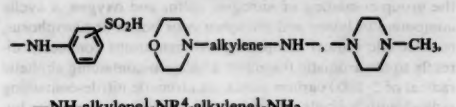
wherein:

Y represents a moiety selected from the group consisting of —N⊕(CH₃)₂-alkylene-NR- An⊖,



and —N⊕(CH₃)₂-alkylene-N⊕(CH₃)₂-2An⊖;

Z represents a moiety selected from the group consisting of -N(R¹)-alkylene¹-N(R²)₂, —N⊕(R¹)₂R³ An⊖,



—NH-alkylene¹-NR⁴-alkylene¹-NH₂

in which alkylene and alkylene¹ are each selected from the group consisting of —CH₂CH₂—, —CH₂CH₂CH₂—, and —CH₂CH₂CH₂CH₂—; R, R¹, R², and R⁴ are each selected from the group consisting of hydrogen, non-tertiary C_1 to C_4 hydroxyalkyl and non-tertiary C_1 to C_4 alkyl; R³ is a non-tertiary C_1 to C_{18} alkyl; and An⊖ is a monovalent anion.

4,347,353
METHOD FOR INHIBITING THE CORROSION-CAUSING TENDENCY AND COLORATION OF HALOGEN-CONTAINING OLEFIN RESIN BLENDS

Shigeo Miyata, Takamatsu, and Masataka Kuroda, Kagawa, both of Japan, assignors to Kyowa Chemical Industry, Co., Ltd., Tokyo, Japan

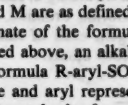
Division of Ser. No. 102,523, Dec. 11, 1979, Pat. No. 4,284,762. This application Apr. 22, 1981, Ser. No. 256,673
Claims priority, application Japan, Dec. 14, 1978, 53/153732
Int. Cl.³ C08K 3/22, 5/09, 5/42
U.S. Cl. 528—485 **5 Claims**

1. In a method for inhibiting the corrosion-causing tendency and coloration of a blend containing at least two members selected from the group consisting of polyethylene, polypropylene, poly(1-butene), poly(4-methyl-1-pentene), an ethylene-propylene copolymer, and a copolymer of at least one alpha-olefin with a diene, said blend containing a halogen component, by incorporating about 0.01 to about 5 parts by weight of a hydrotalcite in the halogen component-containing blend, the improvement which comprises mixing the blend, containing a halogen component attributed to a polymerization catalyst and/or to post-halogenation, with a hydrotalcite of the formula

$$Mg_{1-x}Al_x(OH)_2A^{n-}{}_{x/n}\cdot mH_2O$$

wherein $O<x\leq 0.5$, m is a positive number, and A^{n-} represents an anion having a valence of n,

or with a product resulting from the surface-coating of said hydrotalcite with an anionic surface-active agent selected from the group consisting of an alkali metal salt of a fatty acid of the formula RCOOM in which R is an alkyl group having 3 to 40 carbon atoms and M represents an alkali metal atom, an alkali metal salt of an alkylsulfate of the formula $ROSO_3M$ in which R and M are as defined above, an alkali metal salt of an alkylsulfonate of the formula RSO_3M in which R and M are as defined above, an alkali metal salt of an alkylarylsulfonate of the formula R-aryl-SO_3M in which R and M are as defined above and aryl represents phenyl, naphthyl or tolyl, and an alkali metal salt of a sulfosuccinic ester of the formula



in which R and M are as defined above, said hydrotalcite having

(i) a BET specific surface area of not more than 30 m^2/g, and

(ii) an average secondary particle size of not more than 3 microns.

4,347,354

PREPARATION OF 1-N-[ω-AMINO-α-HYDROXYALKANOYL]AMINO-GLYCOSIDE POLYSILYLATED ANTIBIOTICS AND PRODUCTS OBTAINED THEREFROM

Martin J. Cron, Fayetteville; John G. Keil, Manlius; Jeng S. Lin, Clay; Mariano Ruggeri, Liverpool, and Derek Walker, Jamesville, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation of Ser. No. 33,912, Apr. 27, 1979, abandoned, which is a continuation-in-part of Ser. No. 896,430, Apr. 14, 1978, abandoned, which is a continuation-in-part of Ser. No. 791,806, Apr. 28, 1977, abandoned. This application Oct. 1, 1980, Ser. No. 192,656

Int. Cl.³ C07H *15/22*

U.S. Cl. 536—10 30 Claims

28. Polysilylated 4'-deoxykanamycin A containing from 0 to 2 conventional non-silyl amino-blocking groups on amino groups other than the C-1 amino group.

4,347,355

INHIBITORS OF TRANSPEPTIDASE

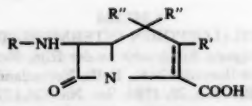
Daniel T. Chu, Vernon Hills, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 123,142, Feb. 21, 1980, abandoned. This application Dec. 1, 1980, Ser. No. 212,006

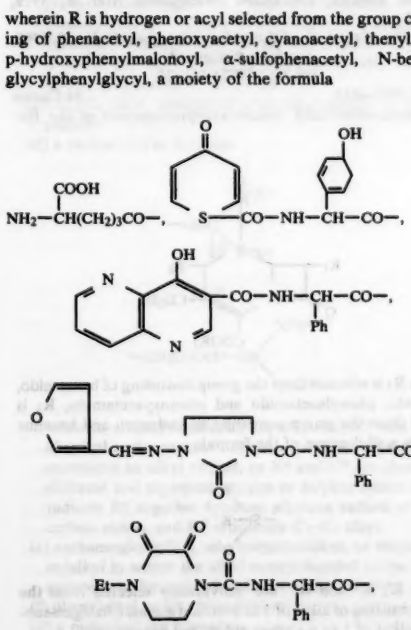
Int. Cl.³ C07D *487/04*

U.S. Cl. 542—420 3 Claims

1. A compound of the formula



wherein R is hydrogen or acyl selected from the group consisting of phenacetyl, phenoxyacetyl, cyanoacetyl, thenylacetyl, p-hydroxyphenylmalonoyl, α-sulfophenacetyl, N-benzoylglycylphenylglycyl, a moiety of the formula



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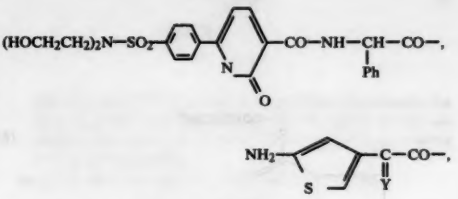


wherein Y is 0 or NOR", and a mercaptoacetyl of the formula $R^{*}SCH_2CO$— wherein R^{*} is phenyl, 4-pyridyl, 2-chloro-2-butenyl, allyl or n-butyl, R' is hydrogen, loweralkyl, loweralkoxyalkyl, loweralkoxy, loweralkylmercapto or phenylmercapto, each R" is loweralkyl, and the broken line represents an optional double bond, and pivaloxymethyl esters thereof.

4,347,356

NOVEL NITROGEN-CONTAINING MONOTERPENE DERIVATIVES

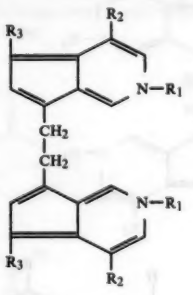
Ryousuke Touyama, Kobe; Hiroyuki Inouye, Kyoto; Tetsuro Shingu, Nishinomiya; Yoshio Takeda, Tokushima; Takeshi Ikumoto, Kobe; Hidetoshi Okuyama, Kobe, and Osamu Yamamoto, Kobe, all of Japan, assignors to Taito Co., Ltd., Tokyo, Japan

Division of Ser. No. 953,275, Oct. 20, 1978, Pat. No. 4,232,159. This application Mar. 31, 1980, Ser. No. 136,080

Int. Cl.³ C07D *401/06*

U.S. Cl. 542—430 5 Claims

1. Compounds of the formula:



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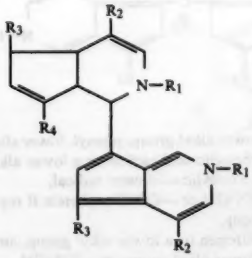

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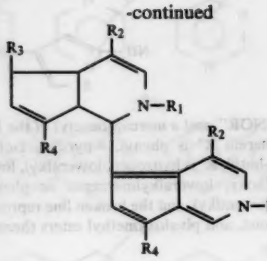

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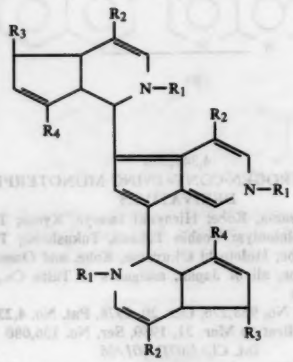

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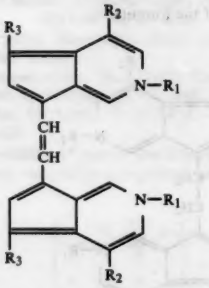

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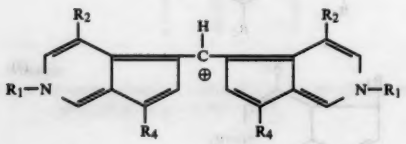


(11)

wherein:

R_1 represents a lower alkyl group, phenyl, lower alkyl group containing carboxylic acid radical or a lower alkyl group containing a carboxylic acid ester radical,

R_2 represents —COOH or —COOR, wherein R represents a lower alkyl group,

R_3 represents hydrogen or a lower alkyl group, and

R_4 represents a lower alkyl group or $—CH_2OH$.

4,347,357

PROCESS FOR THE PREPARATION OF V-TRIAZOLE COMPOUNDS

Alfons Dorlars, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

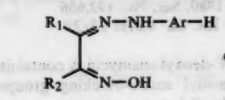
Filed Apr. 30, 1981, Ser. No. 259,307

Claims priority, application Fed. Rep. of Germany, May 22, 1980, 3019521

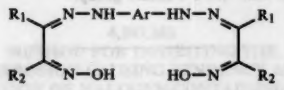
Int. Cl.³ C07D *55/02*

U.S. Cl. 542—462 **2 Claims**

1. In the cyclodehydration of an α-oximinohydrazone of the formula



or



in which

R_1 and R_2 each independently is an optionally substituted alkyl c⁻ aryl radical, and

Ar is an arylene radical,

to produce the corresponding 2-aryl-v-triazole, the improvement which consists essentially of effecting the cyclodehydration at 120° to 200° C. in a predominantly aqueous medium.

4,347,358

CEPHALOSPORIN INTERMEDIATES

Cornelis A. Bruynes, Koudekerk an der Rijn, Netherlands, assignor to Gist-Brocades N.V., Delft, Netherlands

Filed Feb. 29, 1980, Ser. No. 126,127

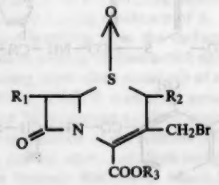
Claims priority, application Netherlands, Mar. 6, 1979, 7901774

The portion of the term of this patent subsequent to Jan. 8, 1997, has been disclaimed.

Int. Cl.³ C07D *501/20*

U.S. Cl. 544—016 **14 Claims**

1. Bromo-substituted deacetoxycephalosporins of the formula



wherein R_1 is selected from the group consisting of benzamido, formamido, phenylacetamido and phenoxyacetamido, R_2 is selected from the group consisting of hydrogen and bromine and R_3 is a silyl group of the formula

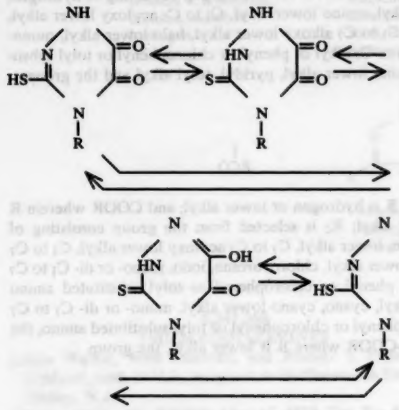
wherein R′, R″ and R‴ are individually selected from the group consisting of alkyl of 1 to 6 carbon atoms, a halogen-substituted alkyl of 1 to 6 carbon atoms and phenyl.

4,347,359
1,2,4-TRIAZINES

Daniel Farge; Pierre Le Roy, both of Thiais; Claude Moutonnier, Le Plessis Robinson, and Jean-Francois Peyronel, Palaiseau, all of France, assignors to Rhone-Poulenc Industries, France

Filed Jan. 15, 1981, Ser. No. 225,446
Claims priority, application France, Jan. 17, 1980, 80 00979; May 13, 1980, 80 10708
Int. Cl.³ C07D *253/06*
U.S. Cl. 544—182 **12 Claims**

1. A triazine of the formula:



I

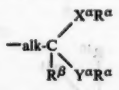
wherein R represents:

(a) 2,2-dimethyl-dioxolan-4-yl methyl or 2,2-dimethyldioxan-5-yl;

(b) C_2–C_4 alkyl substituted with a member selected from the group consisting of alkylsulphonylamino, sulphamoylamino, alkoxycarbonylamino, ureido, alkylureido, dialkylureido and substituted acylamino wherein the acyl group is substituted with hydroxy, amino, alkylamino, or dialkylamino;

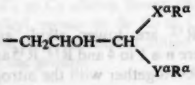
(c) C_2–C_5 alkyl substituted with alkoxyimino or hydroxyimino;

(d) a radical of the formula:



II

or



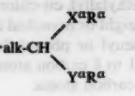
III

wherein alk represents C_1–C_4 alkylene, X^α and Y^α are identical and represent oxygen or sulphur atoms and R^α represents an alkyl radical, or X^α and Y^α are identical or different and represent oxygen or sulphur atoms and the radicals R^α together form an alkylene radical of 2 or 3 carbon atoms, and R^β represents C_1–C_3 alkyl;

(e) carbamoyloxyalkyl, alkylsulphinylalkyl, or alkylsulphonylalkyl in which the alkyl moiety bonded to the triazine grouping in formula I has 2 to 4 carbon atoms;

(f) phenylalkyl or alkylthioalkyl; or

(g) a radical of the formula:



IV

wherein alk, X^α, Y^α, and R^α are as defined previously, the alkyl and acyl moieties of radicals mentioned above are linear or branched and, unless otherwise specified, contain 1 to 4 carbon atoms, or

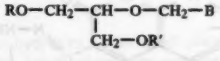
an alkali metal or alkaline earth metal salt thereof.

4,347,360
RING OPEN NUCLEOSIDE ANALOGUES

Kelvin K. Ogilvie, Candiac, Canada, assignor to ens BIO LOGICALS Inc., Toronto, Canada

Filed Sep. 16, 1980, Ser. No. 187,631
Int. Cl.³ C07D *473/18, 473/34*
U.S. Cl. 544—276 **6 Claims**

1. Compounds of the general formula:



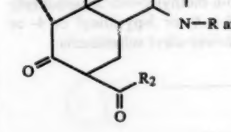
wherein R and R′ are independently selected from hydrogen, and lower alkyl-substituted silyl, and B represents an unsubstituted adenine or guanine group linked to the side group shown in formula (I) above at its 9-position.

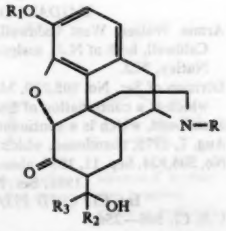
4,347,361
4,5α-EPOXY-3-HYDROXY OR METHOXY-7-(1-HYDROXY-ALKYL OR 1-OXOALKYL)MORPHINAN-6-ONE COMPOUNDS

James E. Quick, Lexington; Raj K. Razdan, Belmont, and Haldean C. Dalzell, Weston, all of Mass., assignors to SISA, Incorporated, Cambridge, Mass.

Filed Dec. 10, 1980, Ser. No. 215,051
Int. Cl.³ C07D *489/02*; A61K *31/485*
U.S. Cl. 546—45 **23 Claims**

1. 4,5α-epoxy-3-hydroxy or methoxy-7-(1-hydroxyalkyl or 1-oxoalkyl)morphinan-6-one compounds characterized by the structural formulae:





wherein R is methyl, cyclopropylmethyl, cyclobutylmethyl, propargyl, allyl, dimethylallyl, cis-chloroallyl or furfuryl; R_1 is H or methyl; R_2 is straight or branched chain alkyl of from 1 to 10 carbon atoms, phenyl or phenylalkyl in which the alkyl chain contains from 1 to 6 carbon atoms, and R_3 is a straight chain alkyl of 1 to 4 carbon atoms.

4,347,362

1-ALKYL-4-AMINO-3-(3-AMINOTRIAZOLO)-1,8 NAPHTHYRIDINE-2-ONES

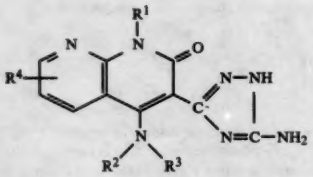
Stanley C. Bell, Narberth, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Oct. 8, 1981, Ser. No. 309,630

Int. Cl.³ C07D *471/04*

U.S. Cl. 546—123 **2 Claims**

1. A compound of the formula:



in which

R^1 is hydrogen or alkyl of 1 to 6 carbon atoms; and

R^2 and R^3 are independently hydrogen or alkyl of 1 to 6 carbon atoms;

R^4 is hydrogen or alkyl of 1 to 6 carbon atoms;

or a pharmaceutically acceptable salt thereof.

4,347,353

PROCESS FOR PREPARING 1,2-DIHYDRO-6-METHYL-2-OXO-5-(PYRIDINYL)-NICOTINONITRILES

Baldev Singh, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Sep. 17, 1981, Ser. No. 303,178

Int. Cl.³ C07D *213/85*

U.S. Cl. 546—249 **3 Claims**

1. The process which comprises reacting pyridinylmethyl methyl ketone with ethoxymethylenemalononitrile in a lower-alkanol to produce 1,2-dihydro-6-methyl-2-oxo-5-(pyridinyl)-nicotinonitrile, where pyridinyl is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents.

4,347,364

IMIDAZODIAZEPINES

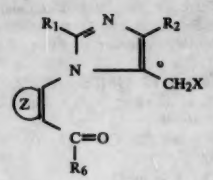
Armin Walser, West Caldwell, and Rodney I. Fryer, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 905,820, May 15, 1978, Pat. No. 4,280,957, which is a continuation of Ser. No. 663,660, Mar. 4, 1978, abandoned, which is a continuation-in-part of Ser. No. 602,691, Aug. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 504,924, Sep. 11, 1974, abandoned. This application Mar. 12, 1981, Ser. No. 242,860

Int. Cl.³ C07D *233/66, 403/04, 409/04*

U.S. Cl. 546—256 **2 Claims**

1. A compound of the formula



wherein R_1 is selected from the group consisting of hydrogen, lower alkyl, amino lower alkyl, C_1 to C_7 acyloxy lower alkyl, phenyl, C_1 to C_7 alkoxy lower alkyl, halo lower alkyl, mono- or di- C_1 to C_7 alkyl or phenyl or chlorophenyl or tolyl substituted amino lower alkyl, pyridyl, tolyl alkyl and the groups

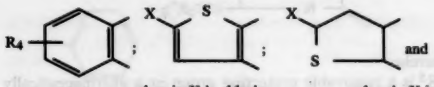
wherein R is hydrogen or lower alkyl; and COOR wherein R is lower alkyl; R_2 is selected from the group consisting of hydrogen, lower alkyl, C_1 to C_7 acyloxy lower alkyl, C_1 to C_7 alkoxy lower alkyl, chloro, bromo, iodo, mono- or di- C_1 to C_7 alkyl or phenyl or chlorophenyl or tolyl substituted amino lower alkyl, cyano, cyano lower alkyl, mono- or di- C_1 to C_7 alkyl or phenyl or chlorophenyl or tolyl substituted amino, the group —COOR where R is lower alkyl, the group

where R is hydrogen or lower alkyl; the group

(where R, R'are lower alkyl, lower alkenyl, phenyl, chlorophenyl, tolyl or together R and R' with the nitrogen atom form a part of a 5- or 6-membered heterocyclic ring); the group

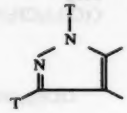
where R^{10}, R^{11}, R^{12} are lower alkyl, and the group $(CH_2)_nNR^{13}R^{14}$ where n is 1 to 4 and R^{13}, R^{14} are hydrogen or lower alkyl or R^{13}, R^{14} together with the nitrogen atom form a part of a 5- or 6-membered heterocyclic ring with limitation that where R^{10}, R^{11} or R^{12} is a basic side chain, then remaining substituents are hydrogen or lower alkyl; R_4 is selected from the group consisting of hydrogen, halogen, nitro, cyano, trifluoromethyl, lower alkyl, mono- or di-C_1 to C_7 alkyl or phenyl or chlorophenyl or tolyl substituted amino, C_1 to C_7 alkoxy lower alkyl and lower alkanoyl; R_6 is selected from the group consisting of phenyl, mono-halo or mono-nitro substituted phenyl, di-halo or halo/nitro substituted phenyl, pyridyl and mono-halo or mono-nitro substituted pyridyl and X is a leaving group selected from the group consisting of halogen and alkyl or phenyl, chlorophenyl or tolyl sulfonate; and

is selected from the group consisting of



wherein X is chlorine, bromine, iodine or hydrogen

wherein X is chlorine, bromine, iodine or hydrogen



wherein T is hydrogen or lower alkyl

4,347,365

IMIDAZODIAZEPINES

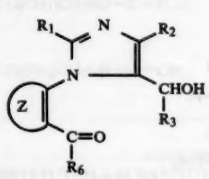
Armin Walser, West Caldwell, and Rodney I. Fryer, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 905,820, May 15, 1978, Pat. No. 4,280,957, which is a continuation of Ser. No. 663,660, Mar. 4, 1978, abandoned, which is a continuation of Ser. No. 602,691, Aug. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 504,924, Sep. 11, 1974, abandoned. This application Mar. 12, 1981, Ser. No. 242,861

Int. Cl.[3] **C07D** *233/66, 403/04, 409/04*

U.S. Cl. 546—256 **1 Claim**

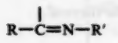
1. A compound of the formula



wherein R_1 is selected from the group consisting of hydrogen, lower alkyl, hydroxy lower alkyl, C_1 to C_7 acyloxy lower alkyl, phenyl, C_1 to C_7 alkoxy lower alkyl, halo lower alkyl, amino lower alkyl, mono- or di- C_1 to C_7 alkyl or phenyl or chlorophenyl or tolyl substituted amino lower alkyl pyridyl, tolyl alkyl and the groups

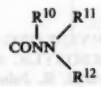
wherein R is hydrogen or lower alkyl and COOR wherein R is lower alkyl; R_2 is selected from the group consisting of hydrogen, lower alkyl, hydroxy lower alkyl, C_1 to C_7 acyloxy lower alkyl, C_1 to C_7 alkoxy lower alkyl, halo lower alkyl, chloro, bromo, iodo, cyano, cyano lower alkyl, mono- or di- C_1 to C_7 alkyl or phenyl or chlorophenyl or tolyl substituted amino lower alkyl, amino lower alkyl, amino, mono- or di- C_1 to C_7 alkyl or phenyl or chlorophenyl or tolyl substituted amino, the group —COOR where R is hydrogen or lower alkyl, the group

where R is hydrogen or lower alkyl, or the group



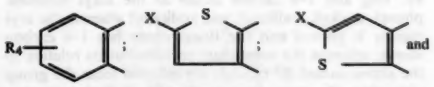
wherein R′ is hydrogen, lower alkyl, hydroxy, phenyl, C_1 to C_7 alkoxy, amino, mono or di-alkylamino and phenyl or tolyl amino and R is hydrogen or lower alkyl, the group

(where R, R′ are hydrogen, lower alkyl, phenyl or tolyl, hydroxy lower alkyl, lower alkenyl, or together R and R′ with the nitrogen atom may form a part of a 5- or 6-membered heterocyclic ring and the group $(CH_2)_nNRR'$ where R and R′ are hydrogen, lower alkyl, hydroxy lower alkyl, lower alkenyl, phenyl, tolyl or together R and R′ with the nitrogen atom form a part of a 5- or 6-membered heterocyclic ring); the group



where R^{10}, R^{11}, R^{12} are hydrogen or lower alkyl, and the group $(CH_2)_nNR^{13}R^{14}$ where n is 1 to 4 and R^{13}, R^{14} are hydrogen or lower alkyl with limitation that where R^{10}, R^{11} or R^{12} is a basic side chain, then remaining substituents are hydrogen or lower alkyl; R_4 is selected from the group consisting of hydrogen, halogen, nitro, cyano, trifluoromethyl, lower alkyl, hydroxy lower alkyl and lower alkanoyl; R_3 is selected from the group consisting of hydrogen and lower alkyl; R_6 is selected from the group consisting of phenyl, mono-halo or mono-nitro substituted phenyl, di-halo or halo/nitro substituted phenyl, pyridyl and mono-halo or mono-nitro substituted pyridyl; and

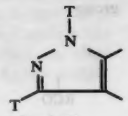
is selected from the group consisting of



wherein X is chlorine bromine, iodine or hydrogen

wherein X is chlorine, bromine, iodine or hydrogen

-continued



wherein T is hydrogen or lower alkyl

and the pharmaceutically acceptable salts thereof.

4,347,366

2-(PYRIDYLTHIO)PYRIDINE-N-OXIDES

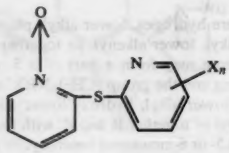
John J. D'Amico, Olivette, and David E. Schafer, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 963,487, Nov. 24, 1978, Pat. No. 4,239,527. This application May 19, 1980, Ser. No. 225,898

Int. Cl.³ C07D *213/62*; A01N *43/40*

U.S. Cl. 546—261 **3 Claims**

1. A compound having the formula



wherein X is halogen and n is 0, 1, 2, 3 or 4.

4,347,367

3-SUBSTITUTED-6-(1'-HYDROXYETHYL)-7-OXO-1-AZABICYCLO[3.2.0]-HEPT-2-ENE-2-CARBOXYLIC ACID

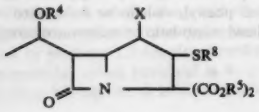
Burton G. Christensen, Scotch Plains; David B. R. Johnston, Warren, and Susan M. Schmitt, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 134,604, Mar. 27, 1980, abandoned, which is a continuation-in-part of Ser. No. 843,375, Oct. 19, 1977, abandoned. This application Nov. 14, 1980, Ser. No. 206,935

Int. Cl.³ C07D *487/04*

U.S. Cl. 546—272 **2 Claims**

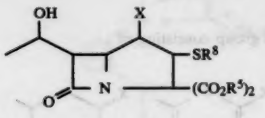
1. A compound selected from the group consisting of:



wherein:

R^4 is hydrogen; R^5 is a removable protecting group or a pharamceutically acceptable ester moiety; and R^8 is selected from the group consisting of hydrogen, substituted and unsubstituted: alkyl, alkenyl, and alkynyl, having from 1–10 carbon atoms; cycloalkyl, cycloalkylalkyl and alkylcycloalkyl, having 3–6 carbon atoms in the cycloalkyl ring and 1–6 carbon atoms in the alkyl moieties; phenyl, aralkyl, aralkenyl, and aralkynyl wherein the aryl moiety is phenyl and the linear chain has 1–6 carbon atoms; wherein the substituent or substituents relative to the above-named R^8 radicals are selected from the group consisting of: amino, mono-, di- and trialkylamino, hydroxyl, alkoxyl, mercapto, alkylthio, phenylthio, sulfamoyl, amidino, guanidino, nitro, chloro, bromo, fluoro, cyano and carboxy; and wherein the alkyl moieties of the above-recited substituents have 1–6 carbon atoms; X is chloro or bromo.

2. A compound having the structure:



wherein:

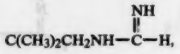
R^5 is a removable protecting group or a pharmaceutically acceptable ester moeity; and

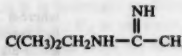
R^8 is selected from the group consisting of:

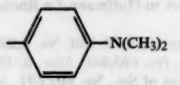
H,

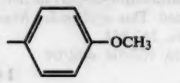
CH_3,

$C(CH_3)_2CH_2NH_2$,



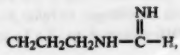


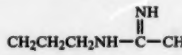




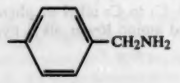
$CH_2CH_2CH_2NH_2$,

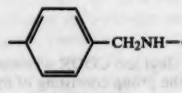
$CH_2CH(CH_3)NH_2$,

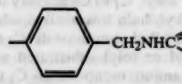




$CH_2CH_2NH_2$







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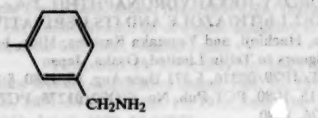
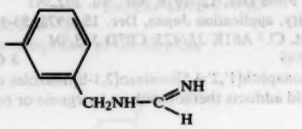
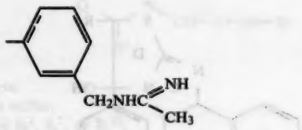
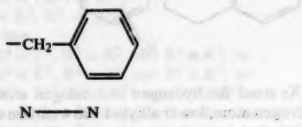
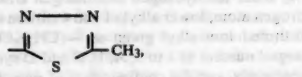
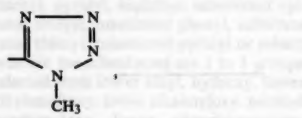




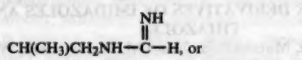


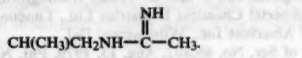






$CH(CH_3)CH_2NH_2$,





4,347,368

3-SUBSTITUTED-6-SUBSTITUTED-7-OXO-1-AZABICYCLO[3.2.0]HEPT-2-ENE-2-CARBOXYLIC ACID

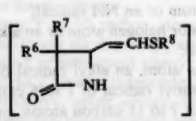
Burton G. Christensen, Scotch Plains; David B. R. Johnston, Warren, and Susan M. Schmitt, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 134,381, Mar. 27, 1980, abandoned, which is a continuation-in-part of Ser. No. 933,681, Aug. 17, 1978, abandoned, which is a continuation-in-part of Ser. No. 843,378, Oct. 19, 1977, abandoned. This application Nov. 14, 1980, Ser. No. 207,042

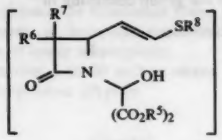
Int. Cl.[3] C07D *487/04*

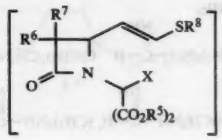
U.S. Cl. 546—272 2 Claims

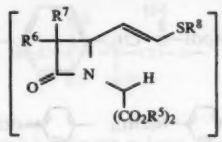
1. A compound selected from the group consisting of:

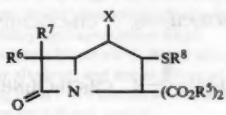


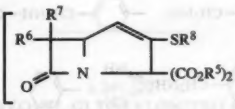
-continued

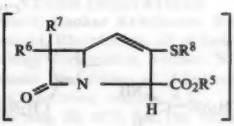






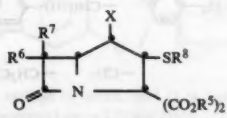






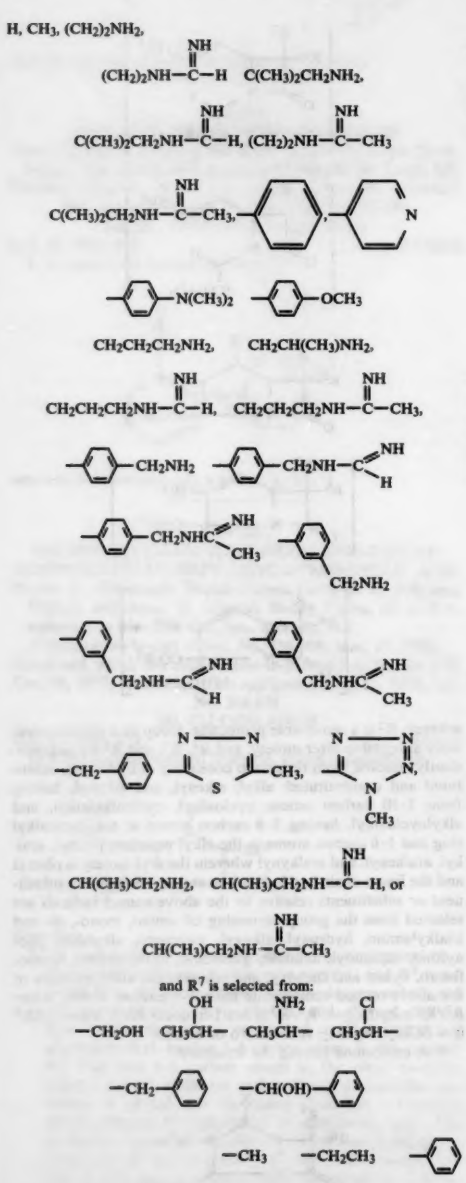
wherein R^5 is a removable protecting group or a pharmaceutically acceptable ester moiety; and R^6, R^7, and R^8 are independently selected from the group consisting of hydrogen, substituted and unsubstituted: alkyl, alkenyl, and alkynyl, having from 1–10 carbon atoms; cycloalkyl, cycloalkylalkyl, and alkylcycloalkyl, having 3–6 carbon atoms in the cycloalkyl ring and 1–6 carbon atoms in the alkyl moieties; phenyl, aralkyl, aralkenyl, and aralkynyl wherein the aryl moiety is phenyl and the linear chain has 1–6 carbon atoms; wherein the substituent or substituents relative to the above-named radicals are selected from the group consisting of: amino, mono-, di- and trialkylamino, hydroxyl, alkoxyl, mercapto, alkylthio, phenylthio, sulfamoyl, amidino, guanidino, nitro, chloro, bromo, fluoro, cyano and carboxy; and wherein the alkyl moieties of the above-recited substituents have 1–6 carbon atoms; when R^7/R^6 is hydrogen, R^6/R^7 is not 1-hydroxyethyl when —SR^8 is —$SCH_2CH_2NH_2$; X is chloro or bromo.

2. A compound having the structure:



wherein R^5 is a removable protecting group or a pharmaceuti-

cally acceptable ester moiety R^6 is hydrogen or methyl and R^8 is selected from the group consisting of:



when R^7/R^6 is hydrogen, R^6/R^7 is not 1-hydroxyethyl when $-SR^8$ is $-SCH_2CH_2NH_2$.

4,347,369

8-HYDROXY-HEXAHYDRONAPHTH[1',2':4,-5]IMIDAZO[2,1-b]THIAZOLE AND ITS DERIVATIVES

Takeshi Hara, Hachioji, and Yasutaka Kayama, Hino, both of Japan, assignors to Teijin Limited, Osaka, Japan

PCT No. PCT/JP79/00316, § 371 Date Aug. 15, 1980, § 102(e) Date Aug. 15, 1980, PCT Pub. No. WO80/01275, PCT Pub. Date Jun. 26, 1980

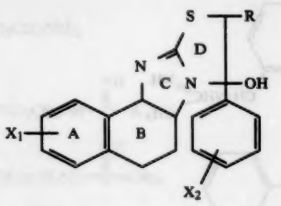
PCT Filed Dec. 12, 1979, Ser. No. 202,383

Claims priority, application Japan, Dec. 15, 1978, 53-154108

Int. Cl.³ A61K *31/425;* C07D *513/04*

U.S. Cl. 548—149 **3 Claims**

1. Hexahydronaphth[1',2':4,5]imidazo[2,1-b]thiazoles of formula [I] and acid adducts thereof with an inorganic or organic acid



[I]

where X_1 and X_2 stand for hydrogen and halogen atoms; R represents a hydrogen atom, lower alkyl of 1 to 4 carbon atoms or carboxyl-substituted low alkyl given as $-(CH_2)_nCOOH$ where n is an integral number of 1 to 3; A, B, C and D symbolize the rings respectively, and the configuration of rings B and C is trans.

4,347,370

GUANIDINE DERIVATIVES OF IMIDAZOLES AND THIAZOLES

David J. Gilman, Macclesfield; James M. Wardleworth, Wilmslow, both of England, and Tobias O. Yellin, Wallingford, Pa., assignors to Imperial Chemical Industries Ltd., London, England and ICI Americas Inc., Wilmington, Del.

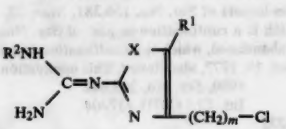
Continuation of Ser. No. 65,802, Aug. 13, 1979, Pat. No. 4,262,126, which is a continuation of Ser. No. 897,912, Apr. 19, 1978, Pat. No. 4,165,378. This application Jul. 25, 1980, Ser. No. 172,302

Claims priority, application United Kingdom, Apr. 20, 1977, 16389/77

Int. Cl.³ C07D *277/40, 263/48*

U.S. Cl. 548—193 **6 Claims**

1. A guanidine compound of the following formula (XIX):



XIX

wherein

X is a sulphur atom or an NH radical;

R^1 is a hydrogen or halogen atom or an alkyl radical of 1 to 6 carbon atoms;

R^2 is a hydrogen atom, an alkyl radical of 1 to 10 carbon atoms, an alkanoyl radical of 1 to 6 carbon atoms or an aroyl radical of 7 to 11 carbon atoms; and

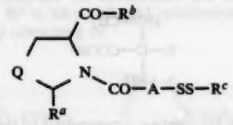
m is 1 to 4.

4,347,371
DISULFIDE COMPOUNDS

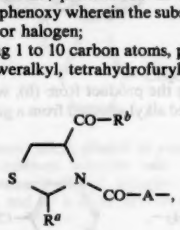
Jun-ichi Iwao, Takarazuka; Masayuki Oya, Ibaraki, and Tadashi Iso, Tondabayashi, all of Japan, assignors to Santen Pharmaceutical Co., Ltd., Osaka, Japan

Filed Dec. 18, 1979, Ser. No. 104,970
Claims priority, application Japan, Dec. 30, 1978, 53-163964; Jan. 29, 1979, 54-9392; Mar. 17, 1979, 54-31334; Jun. 26, 1979, 54-81043; Jul. 3, 1979, 54-84827
Int. Cl.³ C07D 277/02
U.S. Cl. 548—201 20 Claims

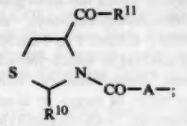
1. A compound of the formula



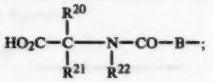
wherein
Q is sulfur;
R^a is R^1, R^7, or R^{10};
R^b is R^2, R^8, or R^{11};
R^c is R^3, R^9, or R^{12};
and when
R^a is R^1, R^b is R^2, and R^c is R^3; or
R^a is R^7, R^b is R^8, and R^c is R^9; or
R^a is R^{10}, R^b is R^{11}, and R^c is R^{12}
A is alkylene having 1 to 3 carbon atoms;
R^1 is lower alkanoylmercapto-lower alkyl, benzoylmercapto-lower alkyl, alkyl having 8 to 20 carbon atoms, alkenyl having 2 to 20 carbon atoms, cycloalkyl, phenyl, furyl, thienyl, pyridyl, naphthyl, substituted cycloalkyl, substituted aralkyl, substituted phenyl, substituted furyl, substituted thienyl, substituted pyridyl or substituted napththyl wherein the substituents are 1 to 3 groups independently selected from lower alkyl, hydroxy, lower alkoxy, lower alkylenedioxy, lower alkanoyloxy, benzoyloxy, benzyloxycarbonyloxy, lower alkanoylmercapto, benzoylmercapto, halogen, nitro, amino, lower alkylamino, lower alkanoylamino, benzoylamino, benzyloxycarbonylamino, carboxy, sulfamoyl and lower alkylaminosulfonyl;
R^2 is hydroxy, lower alkoxy, amino, phenoxy, substituted lower alkoxy wherein the substituent is hydroxy, succinimido, maleimido, phthalimido or lower alkanoyloxy or substituted phenoxy wherein the substituent is hydroxy, lower alkoxy or halogen;
R^3 is alkyl having 1 to 10 carbon atoms, phenyl, lower alkenyl, phenyllowеralkyl, tetrahydrofuryl-lower alkyl, R^{19},



substituted lower alkyl or substituted phenyl wherein the substituents are 1 to 2 groups independently selected from lower alkyl, hydroxy, lower alkoxy, lower alkanoyloxy, benzoyloxy, benzyloxycarbonyloxy, amino, lower alkylamino, lower alkanoylamino, benzoylamino, benzyloxycarbonylamino, carboxy and carbamoyl;
R^7 and R^{10} each is hydrogen or lower alkyl;
R^8 is hydroxy or lower alkoxy;
R^9 is alkyl having 1 to 10 carbon atoms, lower alkenyl, tetrahydrofuryl-lower alkyl, phenyl, aralkyl, R^{19}, substituted lower alkyl or substituted phenyl wherein the substituents are 1 to 2 groups independently selected from lower alkyl, hydroxy, lower alkoxy, lower alkanoyloxy, benzoyloxy, benzyloxycarbonyloxy, amino, lower alkylamino, lower alkanoylamino, benzoylamino, benzyloxycarbonylamino, carboxy and carbamoyl;
R^{11} is amino, phenoxy or substituted lower alkoxy wherein the substituent is hydroxy, succinimido, maleimido, phthalimido or lower alkanoyloxy;
R^{12} is alkyl having 1 to 10 carbon atoms, lower alkenyl, tetrahydrofuryl-lower alkyl or



R^{19} is



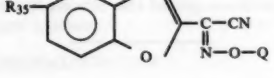
B is lower alkylene;
R^{20} and R^{22} each is hydrogen or lower alkyl;
R^{21} is hydrogen, lower alkyl lower alkanoylmercapto-lower alkyl, or benzoylmercapto-lower alkyl;
wherein the terms lower alkyl, lower alkoxy, lower alkenyl, lower alkylene, and lower alkanoyl refer to groups containing from 1 to 7 carbon atoms, and the cycloalkyl groups are cyclohexyl groups.

4,347,372
BENZOXAZOLYL-GLYOXYLONITRILE-2-OXIME ETHER DERIVATIVES

Werner Föry; Basel; Haukur Kristinsson, Bottmingen; and Henry Szczepanski, Rheinfelden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Henry Szczepanski, Rheinfelden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

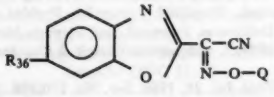
Filed Aug. 28, 1979, Ser. No. 70,288
Claims priority, application Switzerland, Sep. 1, 1978, 9255/78
Int. Cl.³ C07D 263/58; A01N 43/76
U.S. Cl. 548—217 4 Claims

1. A compound of the formula



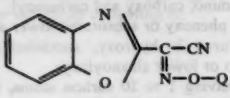
wherein R_{35} is methyl, tert.butyl or chloro, and Q is hydrogen, cyanomethyl, methallyl or —$CON(CH_3)_2$.

3. A compound of the formula



wherein R_{36} is methyl or nitro, and Q is hydrogen, cyanomethyl, allyl, propargyl or —$CON(CH_3)_2$.

4. A compound of the formula



wherein Q is hydrogen; methyl; cyanomethyl; propargyl; benzyl; alkylcarbonyl in which the alkyl group has from 1 to 4 carbon atoms; chloromethylcarbonyl; alkoxycarbonyl in which the alkyl group has from 1 to 4 carbon atoms; ethylthiocarbonyl; alkenylcarbonyl in which the alkenyl group has 2 or 3 carbon atoms; phenylcarbonyl mono-substituted by methyl, methoxy, or nitro, or mono- or di-substituted by chlorine; N-methylcarbamoyl; N-chloromethylcarbamoyl; N-(2'-chloroethyl)-carbamoyl; N-dichlorophenylcarbamoyl; N-allylcarbamoyl; N,N-dimethylcarbamoyl; N-methyl-N-methoxycarbamoyl; 2-furanoyl; or methylsulfonyl.

4,347,373

DERIVATIVES OF 4-METHYL-5-[(2-AMINOETHYL)-THIOMETHYL]-IMIDAZOLE

Franco Turconi, Via S. Dalmazio 14, 21047 Saronno (Varese), Italy

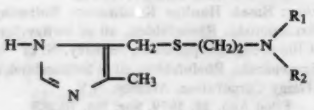
Filed Mar. 9, 1981, Ser. No. 241,563

Claims priority, application Italy, Mar. 18, 1980, 20734 A/80

Int. Cl.³ C07D *233/64, 403/12, 409/12*

U.S. Cl. 548—336 **10 Claims**

1. A derivative of 4-methyl-5-[(2-aminoethyl)-thiomethyl]-imidazole of the formula:



wherein R_1 is —H, —CH_3 or —C_2H_5, wherein R_2 is an acylic radical of an antiinflammatory acid selected from the group consisting of indomethacin, diflunisal, flurbiprofen, indoprofen, 4-diphenylyl-ethyl-acetic acid, ibuprofen, naproxen, suprofen, ketoprofen and salicylic acid and wherein R_1 can equal R_2, or a physiologically acceptable salt thereof.

4,347,374

ACID ADDITION SALTS OF N-TRITYL-α-FLUOROMETHYLHISTIDINE ENANTIOMER DERIVATIVES

Janos Kollonitsch, Westfield; Leroy M. Perkins, Metuchen; George A. Doldouras, Fanwood, and Stephen Marburg, Metuchen, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 21, 1980, Ser. No. 170,398

Int. Cl.³ C07D *233/64*

U.S. Cl. 548—344 **3 Claims**

1. (S) (—)-N_{im}-trityl-α-fluoromethylhistidine methyl ester.d-α-bromocamphor-π-sulfonic acid salt.

4,347,375

PROCESS FOR PREPARING AMINO ACIDS AND ESTERS

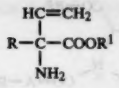
Arthur A. Patchett, Westfield, N.J., and William J. Greenlee, New York, N.Y., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 64,348, Aug. 6, 1979, Pat. No. 4,275,220, which is a continuation of Ser. No. 927,209, Jul. 24, 1978, abandoned. This application Dec. 3, 1980, Ser. No. 212,383

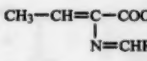
Int. Cl.³ C07D *233/64;* **C07C** *101/30*

U.S. Cl. 548—344 **7 Claims**

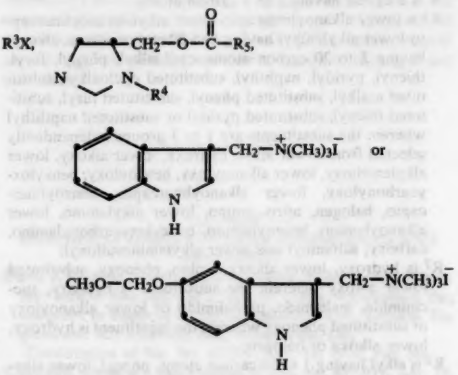
1. A process for preparing compounds having the formula:



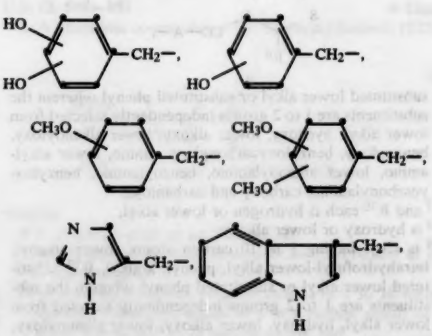
which comprises (a) treating a compound of the formula:



with a strong amine base, (b) reacting the product from (a) with an alkylating agent selected from the group consisting of:



and (c) hydrolyzing the product from (b), wherein R is alkyl, alkenyl or substituted alkyl selected from a group consisting of:



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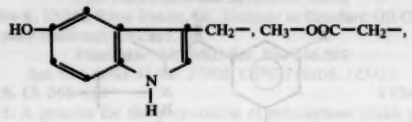
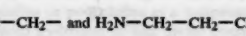
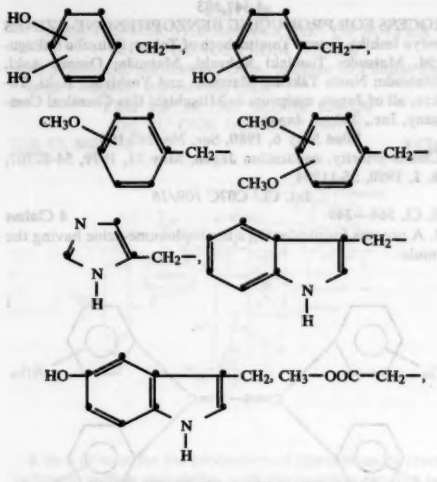
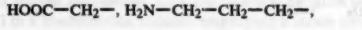
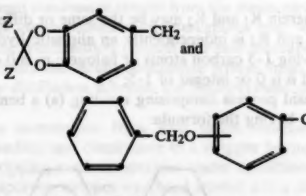




R^1 is lower alkyl, R^2 is the residue of an aldehyde R^2CHO having no α-hydrogen where R^2 is a phenyl or substituted phenyl group wherein the substituents are Cl, Br, I, C_1–C_3 alkyl or NO_2, R^3 is alkyl, alkenyl substituted alkyl selected from the group consisting of:







wherein Z is H, lower alkyl, phenyl or substituted phenyl, R^4 is alkyl or aryl sulfonyl wherein said aryl-sulfonyl is p-toluenesulfonyl, benzenesulfonyl, nitrophenylsulfonyl or chlorophenyl sulfonyl, and R^5 is alkyl, aryl or alkaryl and X is Cl, Br or I.

4,347,376

METHOD OF MAKING AND POLYMERIZING PERFLUOROALKYLENE ACETYLENE COMPOUNDS

Kurt Baum, Pasadena; Clifford D. Bedford, Mountain View, and Ronald O. Hunadi, Los Angeles, all of Calif., assignors to Fluorchem Inc., Azusa, Calif.

Filed Dec. 24, 1980, Ser. No. 219,938
Int. Cl.³ C07F 7/08
U.S. Cl. 556—466 **6 Claims**

1. A method of preparing a fluorinated alkylene compound comprising the steps of:

carrying out the addition reaction of a perfluoroalkyl iodide having the formula $R(CF_2)_nI$, wherein R is —I or —CF_3 and n is a whole number from 5 to about 20, inclusive, and $HC{\equiv}CSi(CH_3)_3$ to form $R'(CF_2)_n$—CH=CISi$(CH_3)_3$, wherein R' is $(CH_3)_3SiIC{=}CH$— or —CF_3; and

subjecting the $R'(CF_2)_n$—CH=CISi$(CH_3)_3$ to dehydrohalogenation with a suitable base to obtain $R''(CF_2)_n$—C≡-CSi$(CH_3)_3$, wherein R'' is —CF_3 or $(CH_3)_3SiC{\equiv}C$—.

4,347,377

PROCESS FOR THE PREPARATION OF POLYHALOGENPHENYL CARBAMATES

Istvan Bitter; Rudolf Soos; Geza Toth; Laszlo Töke, and Gabor Szabo, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T., Budapest, Hungary

Filed Sep. 19, 1980, Ser. No. 188,966
Claims priority, application Hungary, Sep. 14, 1979, CI 1963
Int. Cl.³ C07C 125/067
U.S. Cl. 560—32 **8 Claims**

1. A process for the preparation of a polyhalogenphenyl carbamate of the formula

$$R^2\text{-OCONHR}^1 \quad \text{(I)}$$

wherein

R^1 is aralkyl or aryl in which the aromatic rings can be substituted: and

R^2 is phenyl substituted with three, four or five halogens, which comprises

reacting a compound of the formula

$$R^1\text{-N}{=}CCl_2 \quad \text{(II)}$$

with a polyhalogen phenolate of the formula

$$R^2\text{-OM} \quad \text{(III)}$$

wherein

M is an alkali metal, and subsequently hydrolyzing a compound of the formula

$$(R^2\text{-O})_2C{=}NR' \quad \text{(IV)}$$

in an acidic medium, with or without isolation.

4,347,378

ANTIMICROBIAL GLYCOLIC ACID DERIVATIVES

August V. Bailey, New Orleans; Gordon J. Boudreaux, Metairie, and Gene Sumrell, New Orleans, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 235,812, Feb. 19, 1981. This application Oct. 5, 1981, Ser. No. 308,350
Int. Cl.³ C07C 69/76
U.S. Cl. 560—105 **2 Claims**

1. A diester of glycolic acid having antimicrobial activity and the general structure:

$$C_6H_5CH_2CH_2COOCH_2COOR$$

where R is an alkyl group of 1 to 4 carbon atoms and may be branched or unbranched.

4,347,379

SYNTHESIS OF ALPHA-ALKOXYCARBOXYLIC ACIDS

John T. Lai, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 10, 1980, Ser. No. 129,000
Int. Cl.³ C07C 51/00
U.S. Cl. 562—495 **7 Claims**

1. A method for preparing an alpha-alkoxycarboxylic acid, or alpha-thioalkoxycarboxylic acid, comprising reacting an organic compound selected from the group consisting of alcohols, thioalcohols, phenols and thio-phenols with a cycloalka-

none, dialkylketone or aralkylketone in the presence of (i) a haloform, (ii) alkali metal hydroxide, and (iii) a phase transfer catalyst selected from the group consisting of tertiary and quaternary compounds of Group VA and Group VIA elements, and, a polyether, said phase transfer catalyst being present in an amount sufficient to form a salt of said alpha-alkoxycarboxylic acid or alpha-thioalkoxycarboxylic acid; forming said alpha-alkoxycarboxylic acid or alpha-thioalkoxycarboxylic acid by acidifying said salt; and, recovering said alpha-alkoxycarboxylic acid or alpha-thioalkoxycarboxylic acid.

2. The method of claim 1 including, in addition, de-alkoxylating said alpha-alkoxycarboxylic acid or alpha-thioalkoxycarboxylic acid; and, recovering an alpha-substituted alpha-beta monoolefinically unsaturated carboxylic acid which optionally is also beta-substituted.

4,347,380

N-ACYLSULFONAMIDE HERBICIDAL ANTIDOTES

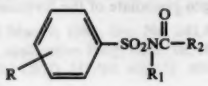
Ferenc M. Pallos, Walnut Creek, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 31,906, Apr. 20, 1979, Pat. No. 4,266,078. This application Nov. 21, 1980, Ser. No. 208,912

Int. Cl.³ C07C *143/82*

U.S. Cl. 564—91 **3 Claims**

1. A compound of the formula



in which

R is methyl or chloro;

R_1 is selected from the group consisting of hydrogen and a metal ion;

R_2 is alkoxyalkyl having 2–5 carbon atoms.

4,347,381

METHOD OF TREATING LONG CHAIN ALKYL AMINES OR PRODUCTS DERIVED THEREFROM

Melvin E. Tuvell, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jan. 24, 1978, Ser. No. 871,811

Int. Cl.³ C07C *85/26*

U.S. Cl. 564—2 **7 Claims**

1. A process of treating pink colored amine products derived from long chain alkyl amines or pink colored long chain alkyl amines to eliminate the pink color in said amine products or said amines, comprising the step of reacting with said amine products or said amines a color eliminating effective amount of hydrogen peroxide at a temperature of at least about 30° to about 60° C. for a period of at least about 5 minutes to about 30 minutes.

4,347,382

3^H LABELED COMPOUNDS

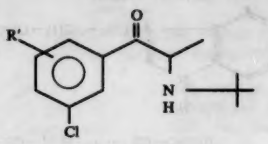
Jeffrey D. Scharver, Durham, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Apr. 15, 1980, Ser. No. 140,606

Int. Cl.³ C07C *25/24*; C07G *7/00*; G01N *33/54*

U.S. Cl. 564—183 **3 Claims**

1. A compound of formula:



wherein R′ is a radioisotope.

4,347,383

PROCESS FOR PRODUCING BENZOPHENONE-AZINES

Tomiya Isshiki; Tetsuo Tomita, both of Tokyo; Shuzabu Sakaguchi, Matsudo; Toshiaki Kohzaki, Matsudo; Osamu Aoki, Matsudo; Norio Takeda, Matsudo, and Yoshiyuki Aoki, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed May 6, 1980, Ser. No. 147,194

Claims priority, application Japan, May 11, 1979, 54-57707; Feb. 1, 1980, 55-11304

Int. Cl.³ C07C *109/16*

U.S. Cl. 564—249 **4 Claims**

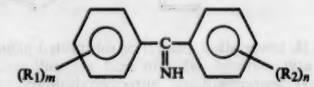
1. A process for producing a benzophenone-azine having the formula:

I

wherein R_1 and R_2 may be the same or different, and each of R_1 and R_2 is independently an aliphatic hydrocarbon radical having 1–5 carbon atoms or halogen; m is 0 or integer of 1–5; and n is 0 or integer of 1–5;

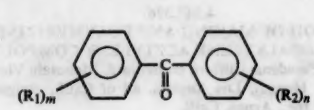
said process comprising reacting (a) a benzophenone-imine having the formula:

II



wherein R_1, R_2, m, and n are as defined above with molecular oxygen; or (b) a benzophenone having the formula:

III



wherein R_1, R_2, m and n are as defined above with ammonia and molecular oxygen at temperature of 60°–300° C., said reaction being carried out in the presence of a catalyst containing at least one material selected from the group consisting of copper; copper alloys; and metal oxides selected from the group consisting of oxides of Cr, Mn, Co, Ni, Tl, Pb, Cu, V and Ag.

4,347,384
PRODUCTION OF MERCAPTANS

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

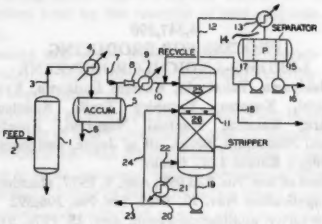
Filed Mar. 23, 1981, Ser. No. 246,669
Int. Cl.³ B01J *31/02, 27/02;* C07C *149/06, 143/16*
U.S. Cl. 568—37 4 Claims

1. A process for the preparation of mercaptans which process comprises reacting olefins or polyolefins at a temperature of about −10° to 70° C. with hydrogen sulfide under pressure of about 1 to 10 atmospheres in the presence of about 0.05 to 10 percent by weight of the olefins of trifluoromethylsulfonic acid.

4,347,385
PROCESS FOR THE SEPARATION OF SULFUR COMPOUNDS FROM WATER

Jack S. Scoggin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 14, 1981, Ser. No. 254,230
Int. Cl.³ C02F *1/04;* C07C *149/06*
U.S. Cl. 568—72 4 Claims



1. In a process for the production of mercaptans by reacting hydrogen sulfide and olefins with the reaction product being separated in a fractionation column employing a steam ejector and forming a steam condensate stream from the steam ejector effluent which is contaminated with mercaptans and other materials from the fractionation column and said mercaptans being separated from the steam condensate stream from the steam ejector by distillation wherein the improvement comprises

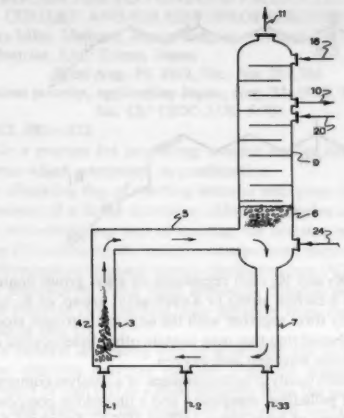
separating the mercaptans from said steam condensate stream by feeding said condensate to a stripper having at least two stripping sections operated under conditions to remove a vaporous stripper overhead stream and a stripper bottoms aqueous stream, and recycling a portion of said stripper bottoms stream to an upper portion of the lowermost stripping section of said stripper.

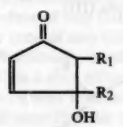
4,347,386
PROCESS FOR PREPARING CYCLOPENTENOLONES

Kenji Saito, Toyonaka, and Hiroshi Yamachika, Ibaraki, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

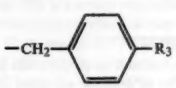
Filed Apr. 22, 1981, Ser. No. 256,570
Claims priority, application Japan, Apr. 30, 1980, 55/58475; Nov. 20, 1980, 55/164372
Int. Cl.³ C07C *45/67*
U.S. Cl. 568—310 4 Claims

1. A process for preparing cyclopentenolones which comprises treating a 4-hydroxy-4-R_2-5-R_1-2-cyclopentenone of the formula:

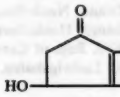




wherein R_1 is an alkyl group having not more than 6 carbon atoms, an alkenyl group having not more than 6 carbon atoms, an alkynyl group having not more than 6 carbon atoms or a group of the formula:



in which R_3 is hydrogen, methyl or halogen and R_2 is a hydrogen atom or a methyl group, provided that when R_2 is hydrogen, R_1 is neither α-methylallyl nor α-methylpropargyl, in an aqueous medium to give the corresponding 2-R_1-3-R_2-4-hydroxy-2-cyclopentenone of the formula:



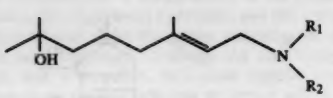
wherein R_1 and R_2 are each as defined above.

4,347,387
PROCESS FOR PREPARING HYDROXYCITRONELLAL

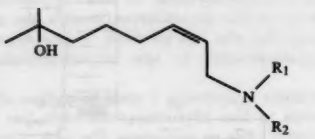
Susumu Akutagawa, Yokohama, and Takanao Taketomi, Chiba, both of Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

Filed Dec. 4, 1980, Ser. No. 212,964
Int. Cl.³ C07C *45/42, 47/20*
U.S. Cl. 568—450 11 Claims

1. A process for preparing hydroxycitronellal comprising isomerizing a 7-hydroxygeranylamine compound (I) or a 7-hydroxynerylamine compound (II), represented by formulae (I) and (II), respectively,



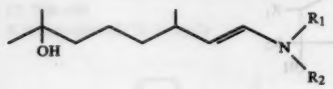
(I)



(II)

wherein R_1 and R_2 each represents an alkyl group containing from 1 to 6 carbon atoms or a cycloalkyl group, or R_1 and R_2 may jointly form together with the adjacent nitrogen atom a 5- or 6-membered ring that may contain other heterocyclic atoms selected from nitrogen and oxygen,

using a catalytically effective amount of a catalyst composed of a divalent palladium compound and a phosphine compound at a temperature of from about 140° to 180° C. for about 5 to 20 hours, to thereby convert the amine compound to a 7-hydroxyaldehydoenamine represented by formula (III)



(III)

wherein R_1 and R_2 are the same as defined above, and then hydrolyzing the enamine using a dilute acid.

4,347,388

3,6-DIMETHYL-3-HYDROXY-OCT-1-YNES AND -OCT-1-ENES, DERIVATIVES OF THESE, AND THEIR USE AS SCENTS, AND IN THE PREPARATION OF 3,6-DIMETHYL-3-HYDROXY-OCTANE

Walter Gramlich, Edingen; Werner Hoffmann, Neuhofen; Leopold Hupfer, Friedelsheim; Bernd Meissner, Heidelberg, and Juergen Paetsch, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

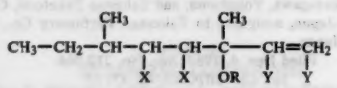
Filed Jul. 2, 1981, Ser. No. 279,801

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1980, 3027269

Int. Cl.³ C07C *33/02, 33/03, 69/145, 69/24*

U.S. Cl. 568—840 **3 Claims**

1. 3,6-Dimethyl-3-hydroxy-oct-1-ene and its derivatives, of the general formula I



(I)

where X and Y are H or the two X's and/or the two Y's together are a further bond between the carbon atoms on which they are present, and R is H, —CO—CH_3, —CO—C_2H_5 or —CO—C_3H_7.

4,347,389

VAPOR PHASE NITRATION OF AROMATIC COMPOUNDS

Ignatius Schumacher, Ballwin, and Kang-bo Wang, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 31, 1980, Ser. No. 221,658

Int. Cl.³ C07C *76/02, 79/10, 79/12*

U.S. Cl. 568—937 **21 Claims**

1. In a process for the vapor phase nitration of aromatic compounds selected from the group consisting of monohalobenzenes and aromatic hydrocarbons where the aromatic compound is contacted with a nitrating agent in the vapor phase to yield the corresponding nitroaromatic compound, the improvement comprising conducting the nitration in the presence of a nitration promoting catalyst consisting essentially of a phosphorous-vanadium-oxygen complex wherein the phosphorus-to-vanadium atom ratio in the phosphorus-vanadium-oxygen complex ranges from about 1:2 to about 2:1 and greater than 50 percent of the vanadium is in the tetravalent state.

4,347,390

PROCESS FOR PRODUCING 1-BROMO-3,5-DICHLOROBENZENE

Ryuzo Nishiyama, Takatsuki; Kanichi Fujikawa, Kyoto; Isao Yokomichi, Kusatsu; Yasuhiro Tsujii, Kusatsu; Itaru Shigehara, Kusatsu; Kuniaki Nagatani, Kusatsu, and Shigeyuki Nishimura, Shiga, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka

Continuation of Ser. No. 823,098, Aug. 9, 1977, abandoned. This application Nov. 13, 1980, Ser. No. 206,392

Claims priority, application Japan, Aug. 25, 1976, 51-100504; Sep. 9, 1976, 51-108518; Oct. 12, 1976, 51-122591; Oct. 12, 1976, 51-122592

Int. Cl.³ C07C *17/02*

U.S. Cl. 570—202 **8 Claims**

1. A process for producing 1-bromo-3,5-dichlorobenzene which comprises;

(a) brominating m-dichlorobenzene, p-dichlorobenzene or a mixture of dichlorobenzene compounds not including more than 20% by weight of o-dichlorobenzene by adding bromine to the dichlorobenzene compound at 0° to 180° C. in the presence of an aluminum halide at a mole ratio of 0.001 to 1 of aluminum halide to total amount of halobenzenes thereby obtaining product bromodichlorobenzene compounds;

(b) isomerizing the product bromodichlorobenzene compounds in the reaction mixture at 80° to 180° C. in the presence of an aluminum halide at a mole ratio of 0.02 to 1 of aluminum halide to total amount of halobenzenes after the bromination reaction thereby forming a product mixture comprising (a) monobromodichlorobenzene, (b) dichlorobenzene, and (c) dibromodichlorobenzene;

(c) distilling the reaction mixture to separate the dichlorobenzene, the monobromodichlorobenzene and the dibromodichlorobenzene components from the reaction mixture;

(d) cooling the monobromodichlorobenzene thereby crystallizing 1-bromo-3,5-dichlorobenzene and separating the same; and

(e) recycling a portion or all of the residue constituting dichlorobenzene, dibromodichlorobenzene and the monobromodichlorobenzene not containing substantial amounts of 1-bromo-3,5-dichlorobenzene into a fresh raw material for said bromination reaction of step (a) or into the bromination product of step (b) which is to be isomerized.

4,347,391

PROCESS FOR PREPARING ETHYLENE DICHLORIDE

Ramsey G. Campbell, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 622,183, Oct. 10, 1975, abandoned, which is a continuation of Ser. No. 368,569, Jun. 11, 1973. This application Jan. 9, 1979, Ser. No. 2,155

Int. Cl.[3] C07C *17/02*

U.S. Cl. 570—252 10 Claims

1. A process for the production of ethylene dichloride in a circulating liquid medium, said liquid medium comprising a liquid selected from chlorinated hydrocarbons containing two carbon atoms and mixtures thereof, said circulating liquid medium being circulated through a reaction zone maintained at a temperature below that at which the liquid medium vaporizes at the pressure maintained therein and at a level of from about 85° C. to about 180° C. and a vaporization zone maintained at a pressure lower than that of the reaction zone and at a temperature such that liquid ethylene dichloride vaporizes under the conditions of pressure and temperature therein, said vaporization zone being disposed above said reaction zone to produce a static pressure on the below-disposed said reaction zone, said process comprising the steps of:

(a) introducing ethylene and chlorine into said reaction zone;

(b) forming crude liquid ethylene dichloride within said reaction zone by the reaction of said ethylene and chlorine;

(c) passing said crude liquid ethylene dichloride with said circulating liquid medium from said reaction zone into said vaporization zone;

(d) vaporizing at least a portion of said crude liquid ethylene dichloride in said vaporization zone by means of the heat of reaction between ethylene and chlorine in said reaction zone to form vaporized impure ethylene dichloride while effecting cooling of said circulating liquid medium; and

(e) passing said vaporized impure ethylene dichloride to a rectification zone, rectifying said vaporized ethylene dichloride by means of the heat of reaction of ethylene and chlorine generated within said reaction zone, and recovering purified ethylene dichloride from said rectification zone while simultaneously returning said cooled circulating liquid medium from said vaporization zone to said reaction zone.

4,347,392

PROCESS FOR THE SELECTIVE HYDROGENATION OF A HYDROCARBON FRACTION WITH 2 OR 3 CARBON ATOMS PER MOLECULE

Jean Cosyns, Maule; Daniel Durand, Rueil-Malmaison, and Gerard Leger, St. Genis les Ollieres, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jun. 9, 1980, Ser. No. 157,764

Claims priority, application France, Jun. 8, 1979, 79 14925

The portion of the term of this patent subsequent to Oct. 28, 1997, has been disclaimed.

Int. Cl.[3] C07C *5/08, 7/00*

U.S. Cl. 585—259 9 Claims

1. A process for selectively hydrogenating a C_2 and/or C_3 hydrocarbon fraction comprising at least one mono-olefinic hydrocarbon, at least one acetylenic hydrocarbon, and at least one diolefinic hydrocarbon, to selectively hydrogenate the acetylenic hydrocarbon and the diolefinic hydrocarbon, without substantial hydrogenation of the mono-olefinic hydrocarbon, comprising contacting said hydrocarbon fraction and hydrogen with a catalyst of palladium-on-alumina, with the average size of the palladium crystallites in said catalyst being at least 50 Angströms.

4,347,393

PROCESS FOR CONTINUOUS PRODUCTION OF CUMENE AND/OR DIISOPROPYLBENZENE

Hisaya Miki, Ichihara, Japan, assignor to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Aug. 19, 1981, Ser. No. 294,204

Claims priority, application Japan, Aug. 22, 1980, 55-114818

Int. Cl.[3] C07C *2/70, 5/22*

U.S. Cl. 585—323 1 Claim

1. In a process for producing cumene and/or diisopropylbenzene which comprises, in combination,

(I) an alkylating step of reacting benzene with propylene in the presence of a liquid aluminum chloride complex catalyst,

(II) a transalkylating step of reacting the reaction product of step (I) containing the complex catalyst with recycle isopropylbenzene compounds from a distillation step (V) below in the presence of added fresh aluminum chloride and hydrogen chloride in a reaction zone different from the reaction zone of step (I),

(III) a catalyst separating step of separating the liquid aluminum chloride complex catalyst from the transalkylation product of step (II) in a zone different from the zone of step (II) and recycling the separated catalyst to step (I) and/or step (II),

(IV) a neutralization step of neutralizing the transalkylation product of step (III) with an alkali in a zone different from the zone of step (III), and

(V) fractionally distilling the neutralization product of step (IV) in a zone different from the zone of step (IV) to recover the cumene fraction and/or the diisopropylbenzene fraction and recycling the remaining isopropylbenzene compounds to step (II); characterized in that

(a) step (I) is carried out at a temperature of about 40° C. to about 85° C. while maintaining the activity coefficient (M) of the catalyst at about 10×10^{-4} to about 300×10^{-4} and the concentration of aluminum chloride in the system at 0.005 to 0.15 mole/liter, and

(b) step (II) is carried out without removing the catalyst from the reaction product of step (I) and at a temperature of about 40° C. to about 75° C. in the presence of added fresh aluminum chloride in an amount of 2 to 20 parts by weight/hr per 1000 parts by weight/hr of diisopropylbenzene in the reaction system while maintaining the activity coefficient (M) of the catalyst in the system at about 30×10^{-4} to about 300×10^{-4} and the concentration of aluminum chloride in the system at 0.3 to 1 mole/liter.

4,347,394

BENZENE SYNTHESIS

Clifford M. Detz, San Rafael, and Leslie A. Field, Oakland, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Dec. 10, 1980, Ser. No. 215,194

Int. Cl.[3] C07C *2/52, 12/46, 15/02*

U.S. Cl. 585—419 13 Claims

1. A process for selectively preparing a product having a substantial benzene content from normal and slightly branched hydrocarbons, comprising

(a) contacting a hydrocarbonaceous feed, which comprises normal and slightly branched hydrocarbons and has a boiling range above about 40° C. and less than about 200° C. with a conversion catalyst which comprises an intermediate pore size zeolite and a platinum compound, and wherein said zeolite is substantially free of acidity; and

(b) recovering a benzene containing effluent.

4,347,395

CONVERSION OF PARAFFINIC HYDROCARBONS TO AROMATICS OVER ZEOLITE CATALYSTS

Yung F. Chu, and Arthur W. Chester, both of Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 13, 1981, Ser. No. 253,132
Int. Cl.³ C07C *12/02, 12/42, 12/46*
U.S. Cl. 585—420 19 Claims

1. A process for producing aromatics from a feedstock containing predominantly paraffinic hydrocarbons of 2 to 16 carbon atoms which comprises contacting said feedstock and air or oxygen with a crystalline zeolite catalyst comprising a zeolite having a constraint index within the approximate range of 1 to 12 and a silica to alumina ratio of at least 12 and having incorporated therein a minor amount of metal or metal oxide oxidative dehydrogenation components.

4,347,396

PROCESS FOR PRODUCING STYRENE

Hirotaka Takano; Hideyuki Takahashi; Ryoichi Hirogohri, and Kohji Kato, all of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Mar. 20, 1981, Ser. No. 246,012
Claims priority, application Japan, Mar. 27, 1980, 55-39196
Int. Cl.³ C07C *15/10*
U.S. Cl. 585—441 4 Claims

1. A process for producing styrene by dehydrogenation of ethylbenzene comprising feeding steam and ethylbenzene to three or more dehydrogenation reactors connected in series, an intermediate heat exchanger for heating the reaction mixture through heat exchange with steam being provided between each of said dehydrogenation reactors, said steam being first used as a medium to heat the respective intermediate heat exchangers, and then said seam being mixed with ethylbenzene supplied as the feed to the first of said series of reactors, wherein 3 to 10 mols of steam are mixed with one mol of ethylbenzene and the temperature and pressure at the inlet of the final dehydrogenation reactor are 600°–680° C. and 0.4–0.8 kg/cm^2 (abs.), respectively.

4,347,397

TREATMENT OF EFFLUENT RESULTING FROM CONVERSION OF METHANOL TO GASOLINE IN ORDER TO DECREASE DURENE AND PRODUCE DISTILLATE

Francis G. Dwyer, West Chester, and Albin Huss, Jr., Chadds Ford, both of Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 27, 1981, Ser. No. 257,693
Int. Cl.³ C07C *5/22*
U.S. Cl. 585—469 12 Claims

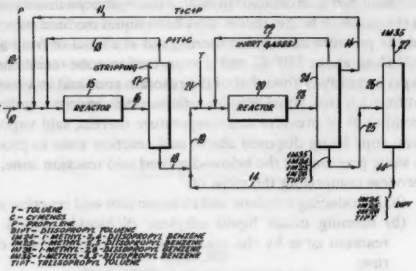
1. In the process for the conversion a methanol to gasoline over a ZSM-5 type zeolite wherein methanol is contacted with said zeolite at elevated temperature in order to effect conversion to gasoline with a concurrent formation of durene, the improvement which comprises: contacting a liquid fraction comprising a durene containing fraction of the effluent from said methanol-to-gasoline conversion process and further comprising less than about five percent by weight benzene with a solid acidic isomerization catalyst having a pore size sufficiently large to admit tetramethylbenzenes at elevated temperatures ranging from about 500° to 1000° F. so as to effect isomerization of said durene to produce 1,2,3,4- and 1,2,3,5-tetramethylbenzenes and thereby diminish the same.

4,347,398

PROCESS FOR PREPARATION OF 1-METHYL-3,5-DIISOPROPYL BENZENE

John M. Crone, Jr., Fishkill, and Robert M. Suggitt, Wappingers Falls, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 135,609, Mar. 31, 1980, Pat. No. 4,314,091. This application Jul. 13, 1980, Ser. No. 282,370
The portion of the term of this patent subsequent to Feb. 2, 1999, has been disclaimed.
Int. Cl.³ C07C *5/22*
U.S. Cl. 585—474 6 Claims



T – TOLUENE
C – CUMENES
P – PROPYLENE
DIIPT – DIISOPROPYL TOLUENE
1MIPB – 1-METHYL-3,5-DIISOPROPYL BENZENE
MIPB – 1-METHYL-3,5-DIISOPROPYL BENZENE
MIPB – 1-METHYL-3,5-DIISOPROPYL BENZENE
MIPB – 1-METHYL-3,5-DIISOPROPYL BENZENE
TIPT – TRIISOPROPYL TOLUENE

1. The method which comprises

isomerizing in an isomerization operation a charge stream containing at least one diisopropyl toluene other than 1-methyl-3,5-diisopropyl benzene in the presence of isomerization catalyst at isomerization conditions including temperature of 200° F.–800° F. thereby forming isomerized product stream containing increased proportions of 1-methyl-3,5-diisopropyl benzene and decreased proportions of other diisopropyl toluenes in the diisopropyl toluene fraction;

recovering from said isomerizing operation and isomerized product stream containing said 1-methyl-3,5-diisopropyl benzene and decreased proportions of other diisopropyl toluene; and

separating 1-methyl-3,5-diisopropyl benzene from said isomerized product stream.

5. The method which comprises

transalkylating in a transalkylation operation a charge stream containing (i) toluene, (ii) desired 1methyl-3,5-diisopropyl toluene and at least one other undesired diisopropyl toluene, and (iii) triisopropyl toluenes, at transalkylating conditions including temperature of 500° F.–625° F. thereby forming transalkylated product stream containing 1-methyl-3,5-diisopropyl benzene and decreased proportions of (i) toluene, (ii) said other undesired diisopropyl toluene, and (iii) said triisopropyl toluenes;

recovering said product stream containing 1-methyl-3,5-diisopropyl benzene and decreased proportions of (i) toluene, (ii) said other undesired diisopropyl toluene, and (iii) said triisopropyl toluenes; and

separating 1-methyl-3,5-diisopropyl benzene from said product stream containing 1-methyl-3,5-diisopropyl benzene and decreased proportions of (i) toluene, (ii) said other undesired diisopropyl toluene, and (iii) said triisopropyl toluenes.

4,347,399

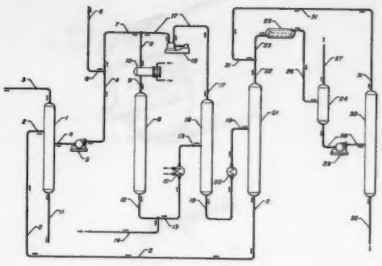
ISOMERIZATION OF NORMAL BUTANE

Lynn H. Rice, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jun. 3, 1981, Ser. No. 270,054
Int. Cl.³ C07C *5/13*
U.S. Cl. 585—738 6 Claims

1. A process for the isomerization of normal butane which comprises the steps of:

(a) introducing a hydrocarbon feed stream comprising mixed butanes into a first separation zone at conditions to produce an isobutane stream and a normal butane stream;
(b) separating the isobutane steam, and passing the normal butane stream into a catalyst-containing isomerization zone in admixture with hydrogen, said isomerization zone being maintained at isomerization reaction conditions;
(c) passing the effluent stream from the isomerization zone into a second separation zone at conditions to produce a hydrogen-rich vapor phase and a liquid hydrocarbon phase comprising isobutane, unreacted normal butane, and C_4-hydrocarbon by-products;
(d) recycling the hydrogen-rich vapor phase to said isomerization zone;
(e) recovering and introducing the hydrocarbon phase into a third separation zone at conditions to produce a butanes stream and a C_4-hydrocarbon by-products stream containing residual hydrogen and isobutane;
(f) returning said butanes stream to said first separation zone for the recovery of isobutane, and recycling unreacted normal butane to said isomerization zone;
(g) passing said by-product stream into a refrigerated fourth separation zone at conditions to provide a hydrogen-rich by-products stream and a liquefied stream comprising isobutane;
(h) separating and recovering the hydrogen-rich by-products stream, and introducing the refrigerated isobutane stream into a fifth separation zone at conditions to separate a vapor phase comprising substantially all of the residual hydrogen and by-products contained therein; and,

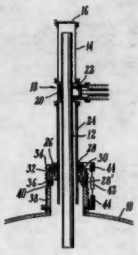


(i) recycling said vapor phase to said refrigerated fourth separation zone, and recovering the liquefied isobutane stream from said fifth separation zone.

4,347,400
APPARATUS FOR REHEATING MOLTEN STEEL IN LADLES

Gabriel Lamarque, Paris, France, assignor to Stein Heurtey, Ris Orangis, France

Filed Oct. 7, 1980, Ser. No. 195,059
Claims priority, application France, Oct. 11, 1979, 79 25293
Int. Cl.³ H05B *7/00*
U.S. Cl. 373—77 **5 Claims**



1. In an apparatus for reheating molten steel in a ladle under a shielding gaseous atmosphere, said apparatus being of the type including at least one fluid-tight electrode housing supporting an elongated electrode and movably extending through a cover of the ladle or of a vessel containing the ladle, and means for sealing the exterior of said housing and thereby for preventing leakage from said cover during relative movement of said housing with respect to said cover, the improvement wherein said sealing means comprises:

a hollow, water-cooled jacket assembly surrounding said housing, said assembly having therethrough a passage through which said housing extends, said assembly having therein annular recesses receiving at least one annular packing contacting the exterior of said housing and at least one annular scraper blade contacting the exterior of said housing;

a collar rigid with said cover;

a flexible, vacuum tight coupling connecting said assembly to said collar; and

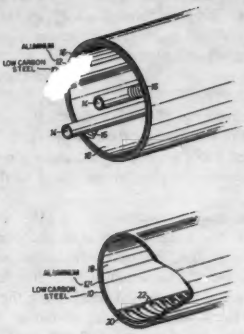
means for limiting movement of said coupling in opposite directions axially of said housing.

4,347,401
GAS-FILLED CABLE WITH COMPOSITE CONDUIT OF LOW CARBON STEEL AND ALUMINUM AND HAVING PARTICLE TRAPS

Niels Knudsen, Lerum; Veikko Orpana, Oxelösund; Matti Wisur, Oxelösund; Olov Wärulf, Oxelösund; Hakan Bergqvist, Mölndal, and Raoul Afzelius, Älvängen, all of Sweden, assignors to SPACAB AB, Oxelösund, Sweden

PCT No. PCT/SE79/00025, § 371 Date Oct. 9, 1979, § 102(e) Date Oct. 2, 1979, PCT Pub. No. WO79/00607, PCT Pub. Date Aug. 23, 1979
PCT Filed Feb. 8, 1979, Ser. No. 185,919
Claims priority, application Sweden, Feb. 9, 1978, 7801543
Int. Cl.³ H01B *9/06;* H02G *5/06*
U.S. Cl. 174—14 R **6 Claims**

1. A gas-filled cable having particle trap means and intended for the transmission of high voltage electric current, said cable including at least one electric conductor, an enclosing conduit comprising a cylindrical metal sheath and a metal shield of non-magnetic material fitting inside said sheath, a plurality of supporting insulators for supporting the at least one electric conductor within said conduit spaced from the interior of said metal shield, said metal shield forming a tube-like lining for said metal sheath, said metal shield having a plurality of openings therethrough spaced therealong defining said particle trap

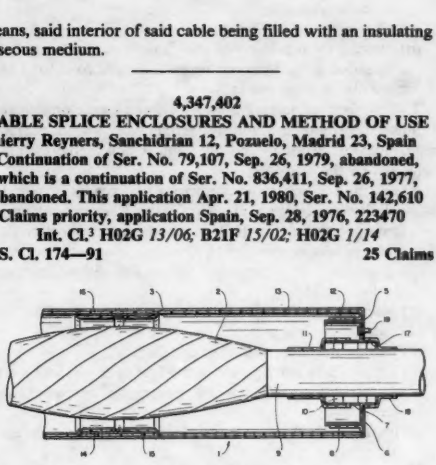


means, said interior of said cable being filled with an insulating gaseous medium.

4,347,402
CABLE SPLICE ENCLOSURES AND METHOD OF USE

Thierry Reyners, Sanchidrian 12, Pozuelo, Madrid 23, Spain

Continuation of Ser. No. 79,107, Sep. 26, 1979, abandoned, which is a continuation of Ser. No. 836,411, Sep. 26, 1977, abandoned. This application Apr. 21, 1980, Ser. No. 142,610
Claims priority, application Spain, Sep. 28, 1976, 223470
Int. Cl.³ H02G *13/06;* B21F *15/02;* H02G *1/14*
U.S. Cl. 174—91 **25 Claims**



1. A method for obtaining access to an electrical splice in a splice casing containing a splice of electrical cable, the casing comprising:

(i) an outer cylindrical envelope (3) which extends beyond the splice, the outer cylindrical envelope having a longitudinal gap along an axial plane and comprising means (4) for closing the gap which means are detachable and can be removed;

(ii) a rigid collar (6) at each end of the envelope (3) between the envelope and one of the cables, the collar comprising an annular interior flange (7) and radially separated therefrom an annular exterior flange (8), wherein at least the interior flange is cylindrical and extends toward the center of the casing;

(iii) for each collar, a first heat-shrinkable sleeve (11) covered on the inside with a bonding agent, which sleeve is applied to the interior cylindrical flange and to the portion of the cable adjacent thereto so as to form a hermetic seal between the interior flange and the cable;

(iv) a flexible sleeve (13) which is applied to the inside of the outer envelope, the sleeve comprising two portions, the adjacent inner ends (30) of the two portions being joined together and the other ends being extended and folded over inward at the end of said envelope and applied to the

outer surface of the outer flange of its respective collar so as to form a hermetic seal therewith, wherein when a pressurized gas is introduced into the casing, the first heat-shrinkable sleeve and the flexible sleeve tend to press more firmly against the surface to which they apply, so that the hermetic seals formed at each end of the envelope are thus rendered tighter, each portion of the flexible sleeve being capable of being inverted and moved towards its respective collar where it remains in the inverted position;

(v) two metallic rings (**14**, **15**) connected to each other by their edges in the median zone of the splice, and wherein the adjacent inner ends (**30**) of the two portions of the flexible sleeve are applied respectively to the surfaces of said rings;

(vi) a second heat-shrinkable sleeve (**16**) applied to and adhering to the outer surfaces of the connected rings immediately below the outer envelope, which second heat-shrinkable sleeve establishes a hermetic joint between the rings, the method comprising the steps of:

(a) removing the outer cylindrical envelope,

(b) removing the second heat-shrinkable sleeve fitted on the two connected rings,

(c) separating the two rings, and

(d) moving each portion of the flexible sleeve towards its respective collar by inverting each portion so as to at least partially uncover the splice.

2. A method of making a joint between two elongate substrates and providing a hollow, hermetically sealed, partially removable enclosure around the joint, which method is characterized by the steps of:

(a) selecting an apparatus comprising two generally cylindrical, flexible sleeves (**13**), each flexible sleeve comprising a first open end section (**12**), a second open end section (**30**), and a generally cylindrical, flexible, deformable connecting section (**32**) connecting the first and second open end section;

(b) placing one of the flexible sleeves over each of the substrates;

(c) joining the substrates to each other;

(d) hermetically sealing each of the first open end sections to its respective substrate by heating a heat-shrinkable sleeve; and

(e) hermetically sealing the second open end sections to each other.

18. A casing for splices of electric cables comprising:

(a) an outer cylindrical envelope (**3**) which extends beyond the splice;

(b) a rigid collar (**6**) at each end of the envelope (**3**) between the envelope and a cable, the collar comprising an annular interior flange (**7**) and radially separated therefrom an annular exterior flange (**8**) wherein at least the interior flange is cylindrical and extends toward the center of the casing;

(c) for each collar, a first heat-shrinkable sleeve (**11**), covered on the inside with a bonding agent which sleeve is applied to the interior cylindrical flange and to the portion of the cable adjacent thereto so as to form a hermetic seal between the interior flange and the cable; and

(d) a flexible sleeve (**13**) which is applied to the inside of the outer envelope, wherein each end (**12**) of the flexible sleeve is extended and folded over inwards at the respective end of said envelope and is applied to the outer surface of the outer flange of said collar so as to form a hermetic seal therewith, wherein when a pressurized gas is introduced into the casing, the first heat-shrinkable sleeves and the flexible sleeve tend to press more firmly against the surfaces to which they are applied, so that the hermetic seals formed at each end of the envelope are thus rendered tighter.

4,347,403

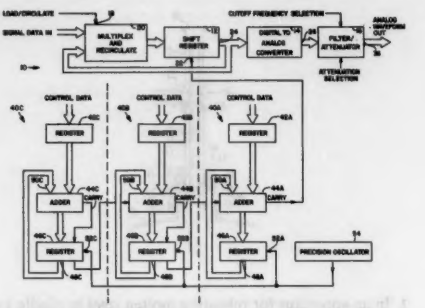
ELECTRICAL WAVEFORM SYNTHESIZER

Joseph E. Schwager, Endwell, and Harry E. Urban, Endicott, both of N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 24, 1980, Ser. No. 143,257

Int. Cl.³ G10L *1/00*

U.S. Cl. 179—1 SA **9 Claims**



1. An electrical waveform synthesizer comprising:

multiplex and recirculate means having a data input, a load/-circulate input, and a recirculated signal input for receiving a digital input signal;

a shift register connected to said multiplex and recirculate means for receipt of digital output signals therefrom and having a plurality of loadable stages for loading digital signals therein, a clock input where clock signals maybe applied to effect shifting of data between said plurality of loadable stages, and an output which is connected to said recirculated signal input of said multiplex and recirculate means;

a digital-to-analog converter connected to said output of said shift register; and

clock means connected to the clock input of said shift register said clock means including a plurality of frequency division circuits, each frequency division circuit further including;

an input register for receiving control signals;

an adder circuit connected to said input register for receipt of augend signals therefrom,

an output register connected to said adder circuit to receive signals therefrom and connected to said adder circuit to provided addend signals therefor and an output connected to adder circuits of succeeding frequency circuits, if any, for providing additional addend signals therefor,

the adder circuit of one of said frequency circuits having an output connected to said shift register clock input, and

an oscillator having an output connected to each of said output registers of said plurality of frequency division circuits.

4,347,404

CONTROL DEVICE FOR AN AUTOMOTIVE VEHICLE FM RADIO

Teruo Kawasaki, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Jun. 26, 1980, Ser. No. 163,280

Claims priority, application Japan, Jul. 2, 1979, 54-82686

Int. Cl.³ H04H *5/00*

U.S. Cl. 179—1 GB **5 Claims**

1. A bass sound control device for an FM car radio, which comprises:

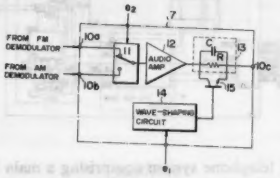
(a) an AM/FM selector for selecting AM broadcasting or FM broadcasting;

(b) a pilot signal discriminator for outputting, where said AM/FM selector selects FM broadcasting, a control signal when stereophonic broadcasting is being received and no signal when monaural broadcasting is being received;

(c) an AM demodulator for outputting AM audio output signals where said AM/FM selector selects AM broadcasting;

(d) an FM demodulator for outputting FM audio output signals where said AM/FM selector selects FM broadcasting, said FM demodulator being connected to said pilot signal discriminator;

(e) an audio amplifier for amplifying the AM audio output signals where said AM/FM selector selects AM broadcasting and the FM audio signals where said AM/FM



selector selects FM broadcasting, said audio amplifier being selectively connected to said AM demodulator or said FM demodulator;

(f) a bass sound reduction means for reducing bass sound, said bass sound reduction means being connected to said audio amplifier;

(g) switching means responsive to the control signal outputted from said pilot signal discriminator, said switching means being connected in parallel to said bass sound reduction means to short said bass sound reduction means when stereophonic broadcasting is being received and to connect said bass sound reduction means in series to said audio amplifier when monaural broadcasting is being received;

whereby the bass sound of the amplified FM audio signals is reproduced in stereophonic broadcasting and is reduced in monaural broadcasting.

4,347,405

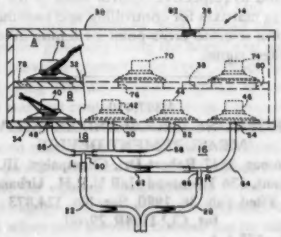
SOUND REPRODUCING SYSTEMS UTILIZING ACOUSTIC PROCESSING UNIT

Lanny C. Davis, Buffalo Grove, Ill., assignor to CBS Inc., New York, N.Y.

Continuation-in-part of Ser. No. 72,965, Sep. 6, 1979, abandoned. This application Aug. 15, 1980, Ser. No. 176,617

Int. Cl.³ H04S *1/00*

U.S. Cl. 179—1 G **27 Claims**



17. An acoustic processing unit for producing first and second composite acoustic signals from at least first and second electro-acoustic signals, said processing unit comprising:

a box-like substantially sealed enclosure having at least first and second openings in a wall thereof,

acoustic transmission means defining first and second separate acoustic output ports acoustically coupled to said first and second openings,

at least first and second electro-acoustic transducers mounted within said enclosure over said at least first and second openings, respectively, for converting said electro-acoustic signals to corresponding acoustic signals and supplying acoustic power only to respective ones of said acoustic output ports and so arranged relative to each other that an energized transducer mechanically induces substantially corresponding vibrations in the other transducers, and

means for supplying first and second different electrical signals to said at least first and second transducers, respectively.

4,347,406

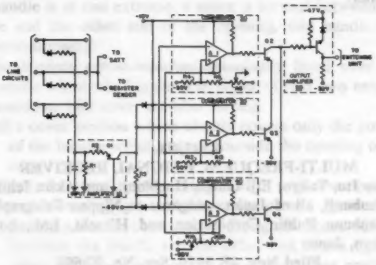
PULSE DETECTOR CIRCUIT

John F. Zurawski, Streamwood, Ill., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Jun. 2, 1980, Ser. No. 155,699

Int. Cl.³ H04B *1/10*; H04Q *3/70*

U.S. Cl. 179—18 D **10 Claims**



1. A pulse detection circuit for use in a telephone switching system, including a line circuit means operated to provide class of service pulses and supervisory signal pulses, said pulse detection circuit comprising:

first detection means connected to said line circuit means, operated to generate a first class of service detection signal in response to detection of each of said class of service pulses appearing during the absence of said supervisory signal pulses; and

second detection means connected to said line circuit means, operated to generate a second class of service detection signal in response to detection of each of said class of service pulses appearing during the presence of said supervisory signal pulses.

4,347,407

ELECTRONIC TELEPHONE CIRCUIT

Peter F. Blomley, Bishop's Stortford, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 27, 1980, Ser. No. 181,590

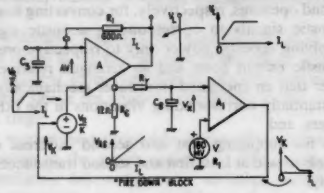
Claims priority, application United Kingdom, Aug. 31, 1979, 7930246

Int. Cl.³ H04M *1/00*

U.S. Cl. 179—81 R **7 Claims**

1. A shunt voltage regulation circuit for a network external to said circuit, said network adapted for the bidirectional transfer of audio frequency signals, said circuit including a first and a second series coupled comparator amplifiers with both amplifiers having two inputs and at least one output, said first

amplifier having a first input coupled to a supply of voltage to said network and a second input coupled to a source of reference voltage whereby an output of said first amplifier is a voltage dependent on the comparison of voltages at said inputs; said output from said first amplifier coupled to said network to supply regulated voltage thereto, a second output of said first amplifier coupled over a path to a first input of said second amplifier to apply a voltage proportional to the output



of said first amplifier to said first input to said second amplifier, a second source of reference voltage coupled to the second input of said second amplifier, the output of said second amplifier coupled to the first source of reference voltage to adjust the first reference voltage in accordance with the value of the voltage of the output of said second amplifier representing a comparison between the voltges at the inputs to said second amplifier.

4,347,408

MULTI-FREQUENCY SIGNAL RECEIVER

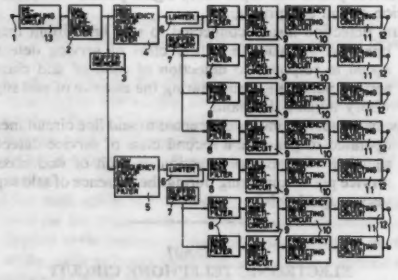
Hiroko Ito, Tokyo; Eiji Ohira, Hachiouji, and Akira Ichikawa, Kokubunji, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Hitachi, Ltd., both of Tokyo, Japan

Filed Nov. 27, 1979, Ser. No. 97,697

Claims priority, application Japan, Dec. 6, 1978, 53-149943

Int. Cl.³ H04M *1/50*

U.S. Cl. 179—84 VF **5 Claims**



1. A multi-frequency signal receiver comprising: input means for inputting digital input signals which have been sampled at a first sampling frequency f_1; resampling means connected to said input means for resampling the digital input signals at a second sampling frequency f_2 which has a value of f_1/n, wherein n denotes an integer having a value of 2 or larger; and digital filter means for selecting signals in predetermined frequency bands among the digital input signals resampled by said resampling means to identify the frequency of the digital input signals.

4,347,409

KEY TELEPHONE SYSTEM

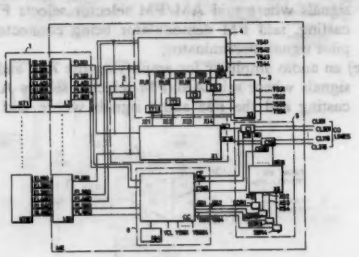
Seiki Ogawa, Tokyo; Michio Mito, and Tsuyoshi Shinoi, both of Kawasaki, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo and Nippon Tsushin Kogyo Kabushiki Kaisha, Kawasaki, both of, Japan

Filed Aug. 18, 1980, Ser. No. 178,950

Claims priority, application Japan, Aug. 20, 1979, 54/104921; Aug. 20, 1979, 54/113353[U]; Aug. 20, 1979, 54/113354[U]

Int. Cl.³ H04Q *5/20*

U.S. Cl. 179—99 P **6 Claims**



1. In a key telephone system comprising a main equipment connected to a plurality of central office lines and a plurality of key telephones connected to said main equipment, an arrangement in which said main equipment comprises:

(a) a central-office-line interface circuit connected to said central office lines,

(b) a key-telephone interface circuit connected to each of said plurality of key telephones,

(c) a first switching matrix including columns, at least some of which are connected to said central-office-line interface circuit, and rows connected to respective said key-telephone interface circuits,

(d) a second switching matrix including columns connected to said central-office-line interface circuit,

(e) a dual-tone multifrequency sending circuit connected at the output end to rows of said second switching matrix,

(f) an intercom trunk circuit connected to remaining columns of said first switching matrix,

(g) a third switching matrix including rows connected to said columns of the first switching matrix which are connected to said intercom trunk circuit and columns connected to a tone source,

(h) a fourth switching matrix including columns connected to said intercom trunk circuit and tone source and rows connected to said key-telephone interface circuits,

(i) a fifth switching matrix inserted between respective ends of the key-telephone interface circuit connected respectively to the first switching matrix and to said fourth switching matrix, and

(j) a main controlling means connected to the key-telephone interface circuit and dual-tone multifrequency sending circuit and to respective control leads of the first to fifth switching matrixes for controlling said switching matrixes to perform selected cross-point switching in response to a call request signal.

4,347,410

MICROPHONE DROOP AND SENSITIVITY MEASUREMENT DEVICE

Paul D. Schomer, 2117 Robert Dr., Champaign, Ill. 61820, and Alan B. Hunt, 326 Townsend Hall U.R.H., Urbana, Ill. 61801

Filed Feb. 26, 1980, Ser. No. 124,873

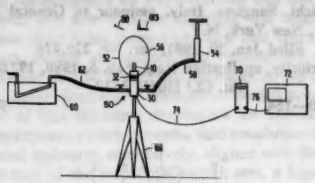
Int. Cl.³ H04R *29/00*

U.S. Cl. 179—175.1 A **72 Claims**

49. An apparatus comprising

(a) an acoustical transducer;

(b) means for applying a positive fluidic pressure with respect to the ambient pressure to said transducer; and



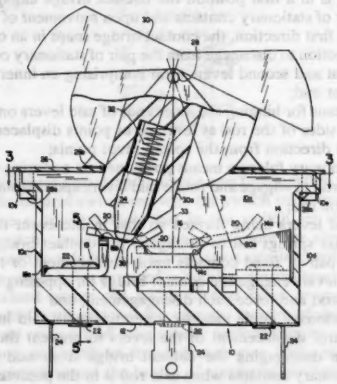
(c) means for reducing said positive fluidic pressure at a fast rate such that an acoustic negative step function is applied to said transducer.

4,347,411

PROGRESSIVE SWITCH

Frank J. Discenza, Rocky Hill, and Milton N. Ives, Wolcott, both of Conn., assignors to Carlingswitch, Inc., West Hartford, Conn.

Filed Dec. 2, 1980, Ser. No. 212,137
Int. Cl.³ H01H *15/00*
U.S. Cl. 200—1 B **12 Claims**



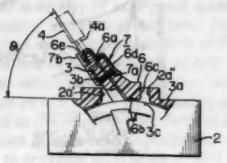
2. A progressive switch comprising a case, actuator means movably mounted in said case, a movable contact connected to said actuator for movement horizontally of said case between first, second and third positions, first, second and third fixed contacts disposed generally along the horizontal path of movement of said movable contact, said first contact having a portion for engaging laterally spaced regions of said movable contact, and said first contact also defining a projecting portion arranged alongside said second contact such that said movable contact regions engage said first and second fixed contacts in said second position for said movable contact, and said third fixed contact so spaced longitudinally from said second contact as to engage one laterally extending edge of said movable contact when said movable contact has its other laterally extending edge still in contact with said first and second fixed contacts.

4,347,412

HANDLE LOCK DEVICE FOR A SWITCH

Kazunobu Mihara, and Kazuyoshi Sugihara, both of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 3, 1980, Ser. No. 109,400
Claims priority, application Japan, Jan. 12, 1979, 54-3170[U]; Jun. 16, 1979, 54-3677[U]
Int. Cl.³ E05B *65/00*; H01H *9/20*; H02H *11/00*
U.S. Cl. 200—42 T **1 Claim**



1. A handle lock device for use with a switch device, the switch device including a case having an elongated opening with two extreme ends, and a rod-shaped handle extending through and movable within said opening and which is capable of being moved between the two extreme positions and when said handle is at one extreme, a space is formed between said handle and the other end of the opening, said handle lock device comprising:

a single-piece cover member detachably fitted over said handle when said handle is in either of said two extreme positions, said cover member having:

(a) a cover portion which closely covers only the portion of the handle which extends outside the opening of the case;

(b) an elongated portion integral with said cover portion and extending generally laterally of said portion and having a size for substantially filling said space which is between the handle and the other end of the opening when the handle is in one of the two extreme positions, thereby preventing the handle from substantially deviating from said one position;

(c) a projection extending from the end of said cover portion at the free end of the handle and having an aperture therethrough transversely of the handle; and

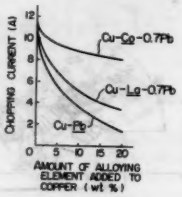
(d) an aperture in said cover portion at a position intermediate the length of the cover portion and extending in a direction generally perpendicular to the direction of said aperture in said projection; and

a separate detent member removably mounted on said cover member and having a tongue portion through said aperture in said cover portion and being sufficiently long for engaging in a hole in the handle when said cover member is on the handle for holding said cover member on the handle, and a cover engaging portion connected to said tongue portion and engaging the end of said cover portion from which said projection extends and having a slot extending inwardly from the free end of said cover engaging portion with the parts on the opposite sides of the slot lying on opposite sides of said projection, the ends of said parts on opposite sides of said slot being bent outwardly away from the end of said cover portion and extending past said aperture in said projection, whereby when a lock hasp is passed through said aperture in said projection, the hasp blocks movement of said outwardly bent ends of said parts from being moved past said projection, thereby preventing movement of said tongue out of said cover portion and thus locking the detent member to the cover member and the cover member to the handle.

4,347,413
ELECTRODES OF VACUUM CIRCUIT BREAKER

Ryuji Watanabe, Tokaimura, and Keiichi Kuniya, Hitachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 30, 1979, Ser. No. 62,117
Claims priority, application Japan, Jul. 28, 1978, 53/91475
Int. Cl.³ H01H 33/66
U.S. Cl. 200—144 B 15 Claims

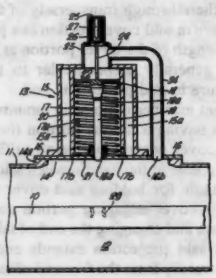


1. An electrode for a vacuum circuit breaker made of a cast alloy consisting essentially of copper, about 0.1 to 20wt % of a rare earth metal and about 0.01 to 10wt % of a metal having a lower melting point and a higher vapor pressure than copper, wherein a part of said rare earth metal and a part of said metal having lower melting point and higher vapor pressure than copper are crystallized in the grain boundary or in the grains of copper.

4,347,414
ARC SHORTING DEVICE

Peter Headley, Tynemouth; Thomas Kelsey, Wylam, and John Murdy, Washington, all of England, assignors to Northern Engineering Industries, Limited, Newcastle-on-Tyne, England

Filed May 5, 1980, Ser. No. 146,297
Int. Cl.³ H01H 33/04
U.S. Cl. 200—144 R 9 Claims

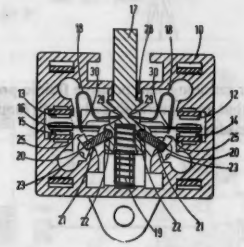


1. An arc-shorting device in high-voltage metal clad switchgear comprising a conductor within an enclosure containing fluid insulating medium, which device comprises a contact movable to a position to interconnect said conductor electrically to said enclosure and piston-and-cylinder mechanism the cylinder of which communicates with the interior of said enclosure, said mechanism being operable in response to a rise in pressure in said fluid medium upon occurrence of an arc in said enclosure to move said contact to said position.

4,347,415
ELECTRIC QUICK-BREAK SWITCH WITH FORCED OPENING OF THE CONTACTS

Fiorino Falchi, Sangano, Italy, assignor to General Electric Company, New York, N.Y.

Filed Jan. 29, 1981, Ser. No. 229,476
Claims priority, application Italy, Feb. 6, 1980, 19728 A/80
Int. Cl.³ H01H 3/32
U.S. Cl. 200—154 9 Claims



1. A snap action electric switch with supplemental means for opening normally closed switch contacts, comprising:
(a) a stationary housing;
(b) a longitudinally movable rod extending within said housing;
(c) at least a pair of stationary contacts fixed in said housing on opposing sides of said rod;
(d) a movable contact bridge extending about said rod;
(e) spring pivot points located on said rod;
(f) snap action springs extending from opposing sides of said contact bridge to said spring pivot points so that when the rod is in a first position the contact bridge engages said pair of stationary contacts and upon movement of the rod in a first direction, the contact bridge snaps in an opposite direction to disengage from the pair of stationary contacts;
(g) first and second levers each comprising an inner and an outer end;
(h) means for hinging the inner ends of said levers on opposing sides of the rod at lever pivot points displaced in the first direction from the spring pivot points;
(i) stationary fulcrum means positioned on opposing sides of the rod to engage and rotate said levers upon displacement of the rod;
(j) said levers being formed so that in the event the snap action springs fail to disengage the contact bridge from the pair of fixed contacts upon displacement of the rod, the levers engage the contact bridge on opposing sides of the rod and force such disengagement; and
(k) stationary guide means cooperating with said levers to control displacement of the levers to prevent the levers from disengaging the contact bridge from said pair of stationary contacts when said rod is in the predetermined position.

4,347,416
MEMBRANE SWITCH CONTROL PANEL ARRANGEMENT AND LABEL ASSEMBLY FOR LABELING SAME

Ralph Ogden, 1304 Fisher St., Munster, Ind. 46321

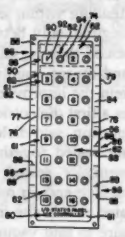
Filed May 12, 1980, Ser. No. 148,907
Int. Cl.³ H01H 9/16
U.S. Cl. 200—317 3 Claims

1. In a membrane switch control panel arrangement of generally quadrilateral configuration including a circuit board having circuitry integrating a predetermined number of control input and output switches including for each switch a switch set including a pair of contacts on one side of the board to be manually closed and a bulb connected for illumination when the switch is closed and a viewing aperture in the board,

adjacent the set contacts, through which the bulb is visible when so illuminated, a membrane sheet of flexible non-metallic material coextensive with and overlying said one side of the board with one side of same engaging said board side, said membrane sheet being formed to define first apertures aligned with each switch set contact pair respectively and having secured over each of its said first apertures on the other side of same a planar electrically conductive switch contact closing member of film thickness dimensions for manual closing of aperture exposed switch contacts, said membrane sheet including second apertures, respectively, aligned with the bulb viewing aperture of the respective switch sets, a legend sheet of flexible non-metallic material coextensive with and overlying said other side of membrane sheet with one side of said legend sheet engaging said other side of said membrane sheet, with said legend sheet bearing location indicia for the respective swtiches and viewing apertures of the respective switch sets, and a rigid mounting sheet to which said circuit board is secured with said membrane sheet and said legend sheet disposed therebetween and with said mounting sheet being apertured to expose for viewing said legend sheet location indicia,

the improvement wherein:

said circuit board switch sets, said membrane sheet first apertures and switch contact closing members thereof, said membrane sheet second apertures, and said legend sheet switch location indicia for the respective switch sets being arranged in like modular form comprising for each module one of the switch sets, a membrane sheet first and second apertures therefor, a membrane sheet contact member for closing the module switch contacts, and leg-



end sheet switch and viewing aperture location indicia for the module switch set, with the switch set of each module being oriented such that in the switch set thereof the switch contacts and viewing aperture are similarly oriented in side by side spaced apart relation, and with said modules being grouped in parallel, spaced apart rows that extend across the width of said panel arrangement of which each said row has an equal number of said modules, said rows are of substantially uniform height and length, and said modules forming each row being in columnar relation across the height of said panel arrangement,

said legend sheet defining for each of said rows and in proximity to same an elongate switch indicia receiving zone, with said zones being of substantially uniform length and height, and being substantially coextensive with the respective rows,

with those of said zones proximating those of said modules having their switch sets integrated in the circuitry each being overlaid by a label affixed to the other side of said legend sheet and paralleling said rows,

said labels respectively bearing in-field applied functional indicia of the switch set of the modules said labels respectively identify,

said labels being of substantially the same length and weight, and disposing said functional indicia thereof in substantially columnar relation to the respective modules served by same,

said legend sheet bearing a quadrilateral marginal delineation in circumscribing relation about said location indicia thereof of which two opposed sides extend normally of said zones,

said mounting sheet aperture complementing said legend sheet marginal delineation,

said legend sheet bearing outside said marginal delineation thereof, and adjacent both said sides thereof, for each of said zones, a pair of label centering indicia lines spaced apart the height of said labels,

said labels having a length that approximates but is short of the distance between said marginal delineation two sides and being approximately centered therebetween,

whereby prior to assembly of said panel arrangement and after said circuitry integration has been completed and said identification and functional indicia of the individual module switch sets of said switches of said circuitry has finally become coordinated and known, said functional indicia for such switch sets of each module group may be in-field applied to the respective labels to be applied to the respective zones that serve, respectively, such module groups, prior to applying such labels to said legend sheet, and each such label may be applied to said legend sheet at its zone indicated by said location indicia by aligning such label with said alignment pairs of centering indicia lines for such zone, and centering such label between said marginal delineation opposed sides, with said label centering indicia lines being covered by said mounting sheet on the assembled relation of said panel arrangement.

4,347,417

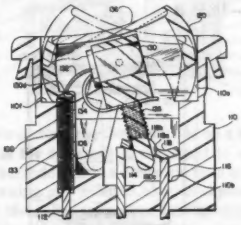
SWITCH CONSTRUCTION

Richard W. Sorenson, Avon, Conn., assignor to Carlingswitch, Inc., West Hartford, Conn.

Filed Feb. 17, 1981, Ser. No. 234,664

Int. Cl.³ H01H *9/18, 5/06, 21/42*

U.S. Cl. 200—67 G **14 Claims**



1. A switch comprising a base of insulating plastic and defining an upwardly open cavity, a plurality of fixed contacts spaced along the bottom wall of said base cavity, said switch having means defining actuator support regions, an actuator including support means cooperating with said support regions to movably support said actuator, said actuator molded of dielectric material and including an integrally formed depending portion, a movable contact element slidably received inside said switch base cavity for pivotal and translational movement generally across the upper ends of certain of said spaced contacts to selectively bridge said certain fixed contacts, a metal spring retained by said integrally formed depending actuator portion and engaging said movable contact element to bias said movable element toward said fixed contacts, said movable contact element having at least one upwardly open recess to loosely receive the lowermost end of said depending actuator portion and said movable contact element having raised laterally spaced portions adjacent said recess for slidably engaging said spring during actuator movement, whereby said element is moved in response to actuator movement and said spring serves as the sole lost motion connection between said contact element and said actuator.

11. A switch comprising a base defining an upwardly open cavity, a plurality of fixed contacts spaced along the bottom

wall of said base cavity, said switch having side wall means defining aligned actuator support regions, actuator means having laterally aligned support means cooperating with said support regions to movably support said actuator means, said actuator means including a depending portion, a movable contact element slidably received inside said switch case cavity for movement generally across the upper ends of certain of said spaced fixed contacts to selectively bridge certain of said fixed contacts, said movable contact element having at least one upwardly open recess to receive said depending portion so that said element is moved in response to actuator means movement, said switch base defining at least one vertically elongated cavity outside the path of movement of said movable contact element, a fixed contact in the bottom wall of said vertically elongated cavity, a resistor in said elongated cavity and having one end in electrical contact with said fixed contact, a compression spring above said resistor and having one end in said elongated cavity and in electrical contact with the other end of said resistor, said spring having its other end engaging said movable actuator means, a lamp located in a recess defined by said actuator means, and at least one electrical lead from said lamp in electrical contact with said spring other end.

4,347,418

HEAT-COOKING APPARATUS INCORPORATING INFRARED DETECTING SYSTEM

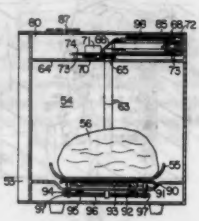
Tomotaka Nobue; Shigeru Kusunoki; Kazunari Nishii, all of Yamatokoriyama, and Keijiro Mori, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 27, 1980, Ser. No. 125,249

Claims priority, application Japan, Mar. 2, 1979, 54-24845; Mar. 2, 1979, 54-24846; Mar. 2, 1979, 54-24848; Mar. 2, 1979, 54-24849; Apr. 20, 1979, 54-54042[U]; May 23, 1979, 54-63670

Int. Cl.³ H05B 9/06

U.S. Cl. 219—10.55 B **20 Claims**



1. In a heat-cooking apparatus including an oven cavity adapted to accommodate the material to be cooked, a heat source for heating said material accommodated by said oven cavity, an infrared sensor adapted to produce a signal proportional to the rate at which infrared rays are applied thereto, an infrared detecting optic system for introducing the infrared rays radiated from said material to said infrared sensor, an infrared detecting circuit system adapted to convert the output of said infrared sensor into an electric signal, and a controller for controlling said heat source in accordance with the output of said infrared detecting equipment, the improvement wherein said infrared detecting optic system includes a peephole through which the infrared rays radiated from said material emerge from said oven cavity, said peephole being formed in one of the walls defining said oven cavity; a stationary reflective plate having a reflective surface facing said oven cavity through said peephole; an elongated shield cylinder having an opening for introducing the infrared rays reflected from said stationary reflective plate to said infrared sensor, said shield cylinder having a length and opening size which defines the radiant area from which originate the infrared rays introduced into said infrared sensor and which protects said infrared sensor from contamination; and means for closing said peephole when the level of the output from said infrared detecting equipment is above the level of a previously set reference signal.

4,347,419

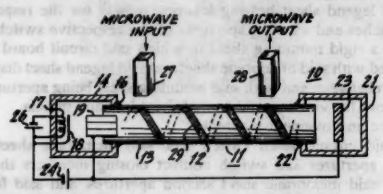
TRAVELLING-WAVE TUBE UTILIZING VACUUM HOUSING AS AN RF CIRCUIT

Louis J. Jasper, Jr., Ocean, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 14, 1980, Ser. No. 140,345

Int. Cl.³ H05B 6/64

U.S. Cl. 219—10.55 A **8 Claims**



1. A microwave device including an elongated, hollow vacuum housing; means sealing a first end of said housing including a heater, a cathode and an anode extending within said housing; means sealing a second end of said housing including a collector extending within said housing; a conductive helix extending longitudinally between said ends of said vacuum housing and sealed therein, said helix having a given thickness dimension; and means coupling rf energy into and out of said helix, wherein the improvement comprises:

said housing includes a first dielectric portion and a second conductive helix portion, said dielectric portion and said helix portion being sealed together to form a unitary, intertwined, hermetically sealed enclosure, said helix having an inner surface and an outer surface, said inner surface being located within the interior of said vacuum housing for exposure to said vacuum and said outer surface being disposed on the outside of said housing for exposure to the outside atmosphere.

4,347,420

MICROWAVE SEAL STRUCTURE IN MICROWAVE OVEN

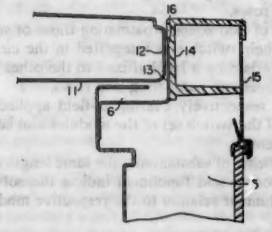
Nobuo Ikeda, Nara; Junzo Tanaka, Fujiidera, and Hirofumi Yoshimura, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 10, 1980, Ser. No. 158,229

Claims priority, application Japan, Sep. 11, 1979, 54-117113

Int. Cl.³ H05B 6/76

U.S. Cl. 219—10.55 D **10 Claims**



1. A microwave heating apparatus comprising:

a heating chamber having an access opening, an inner wall and a front wall;

means for generating microwave energy and for guiding said energy into said heating chamber;

a door for openably closing the access opening of said heating chamber;

a choke secured about the periphery of said door, said choke being received within said heating chamber when said door is in its closed position and spaced from the inner wall of said chamber to provide a gap therebetween, said choke inhibiting microwave energy from leaking from said heating chamber through said gap to the outside of said apparatus when said door is in its closed position;

a wall portion of said door attached to said choke and extending outside said heating chamber with one surface facing the front wall portion thereof when said door is in its closed position, said wall portion having a plurality of slits spaced around the access opening of said door and extending in a direction substantially normal to the edge of said access opening with the tops ends thereof facing the outside of said apparatus; and

means for maintaining the top ends of said slits substantially electrically open to the outside of said apparatus with respect to microwave energy leaking from within said heating chamber when said door is in its closed position.

4,347,421

AUTOMATIC PIPE CIRCUMFERENCE WELDING APPARATUS

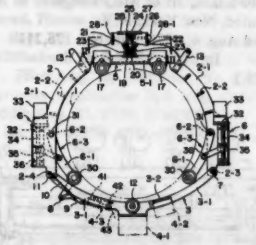
Mutsuo Mukuda; Masahiro Murakami, and Kazuo Aotsuka, all of Amagasaki, Japan, assignors to Sumitomo Precision Products Company Limited, Amagasaki, Japan

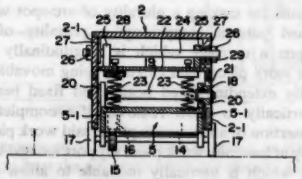
Filed Feb. 11, 1981, Ser. No. 233,576

Claims priority, application Japan, Feb. 15, 1980, 55-18679[U]; Feb. 29, 1980, 55-26589[U]

Int. Cl.³ B23K *9/225*

U.S. Cl. 219—60 A **8 Claims**





1. An automatic pipe circumference welding apparatus comprising: a first arcuate frame including a welding unit and wire feeding means; and a second arcuate frame detachably attached to both the ends of the first-named arcuate frame and including clamp means and guide rollers substantially at both the ends thereof and a running truck having drive wheels substantially at the center thereof, said running truck further having a shaft rotatably laid at the center above the upper surface of the truck body and made slidable in the direction of the height of said running truck, a horizontal plate disposed above said shaft and made slidable in said direction, shock absorbing means interposed between the upper surface of said body and said horizontal plate, and means for pushing said horizontal plate thereby to bring said drive wheels through said shock absorbing means into close contact with a pipe to be welded.

4,347,422

PROCESS AND APPARATUS FOR CONTROLLING THE ELECTRODE ON A SPARK EROSION MACHINE

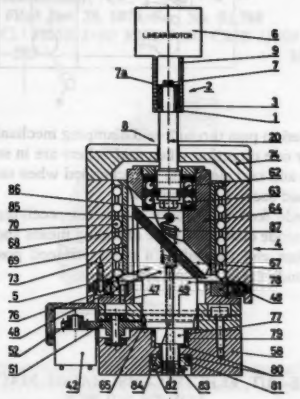
Rudolf Schneider, Reinach, Switzerland, assignor to Erowa AG, Reinach, Switzerland

Filed Mar. 15, 1979, Ser. No. 20,728

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1978, 2811274

Int. Cl.³ B23P *1//12*

U.S. Cl. 219—69 M **6 Claims**



1. A process for controlling the electrode on a spark erosion machine, wherein the electrode is subjected to a drive force advancing the electrode within a dielectric fluid until it reaches the required working gap relative to a workpiece to be machined, wherein the force acting on the electrode due to the drive force and the pressure in the dielectric fluid is measured and the advancing speed at which the electrode is moved towards the workpiece is controlled in dependence on said measured force such that the said force is limited to a predetermined value.

4,347,423

ELECTRIC DISCHARGE MACHINE

Hideo Katsube, Hachioji; Gotaro Gamo, Komae; Yoshiyuki Nomura, and Kanemasa Okuda, both of Hino, all of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Jun. 4, 1980, Ser. No. 156,396

Claims priority, application Japan, Jun. 15, 1979, 54-75277

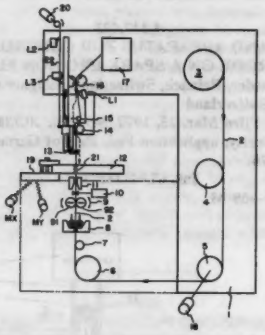
Int. Cl.³ B23P *1/08*

U.S. Cl. 219—69 W **10 Claims**

1. An electric spark machine for machining a workpiece by an electric spark generated between the workpiece and a flexible, elongated electrode which is fed longitudinally from a first side of the workpiece to a second side of the workpiece to provide a fresh supply thereof while predetermined relative motion is established between the workpiece and the electrode, which comprises:

clamping mechanism means for clamping the electrode when the electrode breaks, the portion of the electrode which is clamped being on the first side of the workpiece,

wherein the clamping mechanism means comprises a block having an inwardly tapered surface, a pair of rollers between which said electrode passes, said rollers being mounted to move between a first position in which said rollers contact said inwardly tapered surface and a second position in which said rollers are spaced apart from said inwardly tapered surface, whereby said electrode is permitted to pass through said clamping mechanism means in only one direction when said rollers are in said first position and said electrode is unclamped when said rollers are in said second position; and



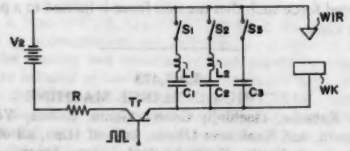
electrode feed mechanism means for receiving the broken electrode clamped by the clamping means and moving the broken end thereof to a predetermined position on the second side of the workpiece.

4,347,424

WIRE-CUT, ELECTRIC-DISCHARGE MACHINING POWER SOURCE

Haruki Obara, Sagamihara, Japan, assignor to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Sep. 29, 1980, Ser. No. 191,447
Claims priority, application Japan, Oct. 4, 1979, 54-128380
Int. Cl.³ B23P *1/02*
U.S. Cl. 219—69 C **4 Claims**



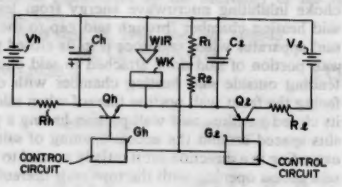
1. An improved wire-cut, electric-discharge machining power source of the type employing a transistor-capacitor discharge circuit, wherein the improvement comprises: a plurality of inductors having different inductance values; a plurality of capacitors of different capacitance values, each capacitor being series-connected to one of the plurality of inductors to form a plurality of capacitor-inductor pairs, the inductance value of the inductor in any capacitor-inductor pair being greater than the inductance value of the inductor in any other capacitor-inductor pair that includes a capacitor having a smaller capacitance value; and switch means for selectively connecting the capacitor-inductor pairs to the transistor-capacitor discharge circuit.

4,347,425

WIRE-CUT, ELECTRIC-DISCHARGE MACHINING POWER SOURCE

Haruki Obara, Sagamihara, Japan, assignor to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Sep. 29, 1980, Ser. No. 191,448
Claims priority, application Japan, Oct. 5, 1979, 54-128702
Int. Cl.³ B23P *1/02*
U.S. Cl. 219—69 C **4 Claims**



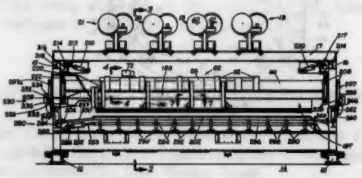
1. An electric-discharge machining power source for using an electrode to machine a workpiece comprising: a first low-current discharge circuit means for making the electrode positive and the workpiece negative to produce a reverse discharge; means for detecting the potential between the electrode and the workpiece to determine when the reverse discharge occurs; and a second high-current discharge circuit means, responsive to the means for detecting the potential, for making the electrode negative and the workpiece positive to produce a main machining discharge upon detection of the reverse discharge.

4,347,426

ARC-SPOT WELDING METHOD AND APPARATUS

Don A. Ware, St. Charles; Steve A. Coughlin, Ballwin, and Oscie B. Whatley, Florissant, all of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Aug. 4, 1980, Ser. No. 175,211
Int. Cl.³ B23K *9/12*
U.S. Cl. 219—125.1 **40 Claims**

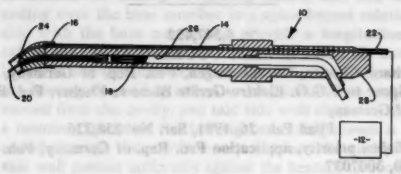


1. Apparatus for making a plurality of arc-spot welds in a predetermined pattern comprising: a plurality of torches mounted upon a carriage which is longitudinally movable relative to a work piece; said carriage being movable along a longitudinally extending fixed beam; said fixed beam being movable vertically to allow removal of a completed work piece and insertion of a new work piece; said work piece being supported by at least one work piece support located below the work piece which is vertically movable to allow exit of a completed work piece and insertion of a new work piece; a clamping assembly mounted above said work piece support and being movable toward said work piece to engage said work piece and hold it in place for welding and being movable away from the work piece to allow exit of completed work piece; said carriage being provided with control means which stops said carriage whereby said torches will be located at positions above the work piece corresponding to the desired pattern.

4,347,427
SUBMERGED ARC WELDING GUN

Dennis R. Centilo, Jeannette; Donald A. Smith, Greensburg, and David L. Pifer, Jeannette, all of Pa., assignors to Elliott Turbomachinery Co., Inc., Jeannette, Pa.

Filed Jun. 19, 1980, Ser. No. 161,233
Int. Cl.³ B23K 9/18
U.S. Cl. 219—137.8 3 Claims

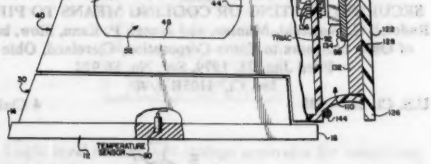


1. A submerged arc welding gun comprising:
first passage means for directing a welding wire from an entrance end of the gun to a discharge end of the gun,
second passage means for directing welding flux material from an entrance end of the gun to the discharge end of the gun, a source of fluid under pressure for propelling welding flux through the second passage means,
a nozzle member having discharge opening encircling the discharge end of the gun so that welding flux and welding wire pass simultaneously from the gun, the nozzle having at least one opening formed therein for venting the fluid to accomplish substantial separation of the fluid from the flux with the width of said one opening being substantially less than the width of the discharge opening.

4,347,428
HANDLE AND SUPPORTING STRUCTURE FOR AN ELECTRIC PRESSING IRON HAVING ELECTRONIC TEMPERATURE CONTROL

Rainer Conrad, Hanau, and Hubert Seifert, Heusenstamm, both of Fed. Rep. of Germany, assignors to Rowenta-Werke GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed Aug. 15, 1980, Ser. No. 178,407
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1979, 2934520; Aug. 27, 1979, 7924294[U]
Int. Cl.³ H05B 1/02; D06F 75/26, 75/34
U.S. Cl. 219—251 6 Claims

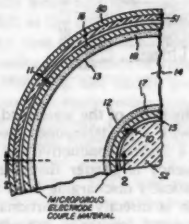


1. In a pressing iron comprising a soleplate, an electric heater arranged to heat the soleplate when the electric heater is energized, a supporting structure mounted to the soleplate, a handle supported by the supporting structure and spaced from the soleplate and the electric heater, an electronic temperature control including a temperature sensor responsive to the temperature of the soleplate, a thyristor controlling energization of the electric heater and tending to emit heat, other electronic components tending to be affected adversely by heat, and a cooling plate mounted to the thyristor so as to dissipate heat from the thyristor, the supporting structure having a cavity containing the thyristor and the cooling plate, and the electronic components tending to be affected adversely by heat being located in the supporting structure but outside the cavity at a location remote therefrom, so as to be remote from the thyristor and the cooling plate, as well as from the soleplate and the electric heater, an improvement wherein the cooling plate is mounted to a detachable wall of the supporting structure, wherein the detachable wall is detachable for replacement of the thyristor without separation of other parts of the supporting structure from the soleplate, and wherein the detachable wall is shaped so as to provide a resting stand, which allows the pressing iron to be rested flatly upon a horizontal surface without contact between the soleplate and the horizontal surface.

4,347,429
HIGH CAPACITY CORROSION AND EROSION RESISTANT ELECTRODES FOR AC ELECTRODE BOILERS

Fritz G. Will, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 28, 1979, Ser. No. 52,788
Int. Cl.³ H05B 3/60; F22B 1/30; C25B 11/04
U.S. Cl. 219—288 16 Claims



1. An electrode boiler containing an aqueous electrolyte and a pair of spaced electrodes connected to an AC power source and separated by said aqueous electrolyte, each said electrode comprising:
an electrically conductive metal substrate; and
a microporous electrochemically active mass comprising a reversible electrode couple adhering to one face of said substrate covering substantially the entire said face of said substrate and being present in such quantity that at least some of each member of said electrode couple is present at all times during use, said electrodes being disposed with said active masses facing each other and in contact with said electrolyte, said electrode couple consisting essentially of a material which is electrochemically reversibly oxidized and reduced in response to AC current flow therethrough from one electrode to the other allowing high current density use without promoting corrosion and erosion of the electrodes.

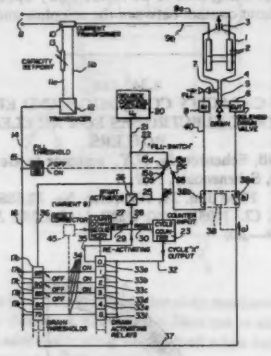
4,347,430
VAPOR GENERATOR WITH CYCLING MONITORING OF CONDUCTIVITY

Michael Howard-Leicester, Edelweiss Valley, General Delivery, Wilson's Corner, Quebec; Siegbert Gundacker, Kars, and Larry J. Moffatt, Ottawa, all of Canada, assignors to Michael Howard-Leicester, Quebec, Canada

Filed Feb. 14, 1980, Ser. No. 121,408
Int. Cl.³ H05B 1/02, 3/60
U.S. Cl. 219—295 26 Claims

1. A method of operating a water-vapor generator comprising a vaporization vessel containing water and having electrodes which are connected to a power supply between which flows a current the magnitude of which depends on the depth of immersion of the electrodes in the water in the vessel and

the conductivity of the water, the method comprising continuously measuring the magnitude of the electrode current, filling the vessel with water to an extent to give a predetermined maximum electrode current, allowing water in the vessel to boil off until a predetermined minimum electrode current is achieved, re-filling the vessel to obtain again the predetermined maximum electrode current and repeating the boiling and filling steps to provide a plurality of cycles each containing a boil leg and a fill leg, obtaining a measure of the frequency of each of successive pluralities of cycles which corresponds to



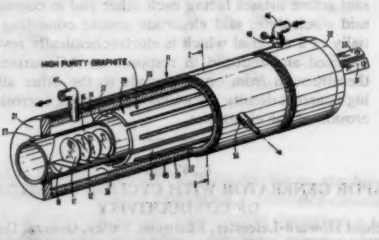
the actual conductivity of the water and comparing the measure obtained with a predetermined frequency value which corresponds to a desired conductivity of the water, and if the measured frequency is greater than the predetermined frequency, automatically discharging from the vessel a quantity of water which is directly proportional to the amount by which the measured frequency exceeds the predetermined frequency, whereby said quantity of water discharged is directly proportional to the difference between the actual conductivity and desired conductivity of the water.

4,347,431

DIFFUSION FURNACE

Charles W. Pearce, Emmaus, and Paul F. Schmidt, Allentown, both of Pa., assignors to Bell Telephone Laboratories, Inc. and Western Electric Company, Inc., both of New York, N.Y.

Filed Jul. 25, 1980, Ser. No. 172,120
Int. Cl.³ H05B *3/10*
U.S. Cl. 219—390 **6 Claims**



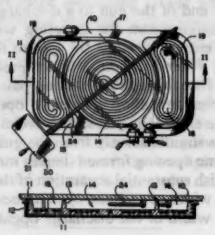
1. A diffusion furnace which comprises:
- a central process tube of a material taken from the group of silicon and quartz;
- a resistance heating element of a high purity graphite material having an ash content of no more than 100 parts per million, said element being disposed about said process tube; and
- an insulative envelope substantially enclosing the process tube and forming with said process tube an annular heater chamber for housing the heating element, said envelope having an inner wall of a material taken from the group of high purity graphite having an ash content of no more than 100 parts per million and quartz, such that the combination of the heating element and said envelope and process tube are capable of heating the space within said process tube to a temperature range including temperatures of 700° C. and 1250° C. substantially without contaminating transfer of undesirable impurities from such heater chamber toward the space within the process tube.

4,347,432

GLASS CERAMIC COOKING APPLIANCE

Gerhard Gössler, Oberderdingen, Fed. Rep. of Germany, assignor to E.G.O. Elektro-Geräte Blanc u. Fischer, Fed. Rep. of Germany

Filed Feb. 26, 1981, Ser. No. 238,226
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1980, 3007037
Int. Cl.³ H05B *3/68*
U.S. Cl. 219—449 **10 Claims**



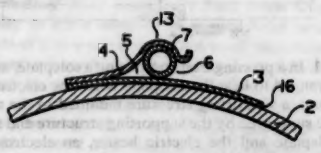
1. A glass ceramic cooking appliance, comprising:
- a glass ceramic cooking surface; at least two electric heating means for the cooking surface;
- means for individually switching the at least two heating means on and off;
- a temperature sensor subject to the thermal influence of each of the at least two heating means; and
- a thermal cutout, operable in response to the temperature sensor, and having a variable operating temperature which can be changed in response to the switching means; and,
- an insulating tray the at least two heating means and the switching and thermally separating the at least two heating means.

4,347,433

HEAT TRANSFER APPARATUS FOR RELEASABLY SECURING HEATING OR COOLING MEANS TO PIPE

Rudolph G. Wojtecki, Mantua, and Joseph P. Kaan, Stow, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 21, 1979, Ser. No. 50,922
Int. Cl.³ H05B *3/40*
U.S. Cl. 219—535 **4 Claims**



1. A heat transfer apparatus adapted to lay along the outer surface of a pipe having an outer circumference radius of curvature and to releasably secure an elongate heating or cooling means to the pipe, said apparatus comprising:

an elongate heat conductive base member having a wall having sufficient flexibility to conform to the radius of curvature of the outer circumference of the pipe,

a single resilient side wall extending from the side of the base member that faces away from the pipe, said side wall extending over the base member to provide a longitudinally extending cavity therebetween that extends along the entire length of the base member and is suitably sized to contain the heating or cooling means, said side wall ending over the base member in a spaced-apart relationship with the base member to provide a longitudinally extending entrance-way into the cavity along the entire length of the base member that is suitably sized to permit the heating or cooling means to be inserted into and removed from the cavity, and said side wall shaped in such a manner that when the heating or cooling means is inserted through the entrance-way and into the cavity the side wall presses uniformly against the heating or cooling means and urges said means against the base member to provide a more effective heat transfer contacting relationship therebetween, and

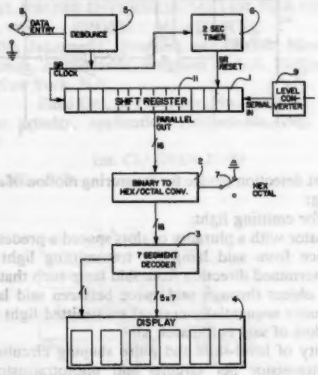
means disposed along the length of the apparatus for securing the apparatus to the outer surface of the pipe, said securing means adapted to provide a secured heat transfer contacting relationship therebetween and designed so as not to interfere with the entrance-way in order that the heating or cooling means can be inserted into and removed from the cavity without having to release the apparatus from the pipe.

4,347,434

HAND HELD DATA BUS ANALYZER

Albert Kovalick, Santa Clara, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 18, 1980, Ser. No. 113,009
Int. Cl.³ G01R *31/02*
U.S. Cl. 235—92 SH **6 Claims**



1. Logic level sensing and storage apparatus for assembling a digital word in a selected sequence from a data paths, said apparatus comprising:

a probe tip;

a shift register means coupled to said probe tip for containing a digital word therein;

a display means coupled to said shift register means for displaying a visual indication of said digital word;

a manually activated switch coupled to said shift register means; and

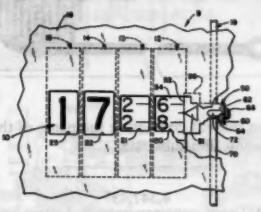
means for clocking a representation of a first data bit on a data path in electrical contact with said probe tip into said shift register means in response to activation of said manually activated switch.

4,347,435

READOUT MECHANISM FOR FUEL PUMP COUNTER

Alfred C. Evans, Simsbury, and Bruno S. Smilgys, Hartford, both of Conn., assignors to Veeder Industries, Inc., Hartford, Conn.

Filed Jan. 26, 1981, Ser. No. 228,320
Int. Cl.³ B67D *5/22*; G01D *13/22*
U.S. Cl. 235—94 R **8 Claims**



1. In a fuel pump cost counter for registering the accumulated cost count of fuel delivered and having a plurality of cost counter wheels coaxially mounted in ascending order of significance from right to left as the counter is read from the front thereof, the first order cost counter wheel having an outer indicia rim with an annular arrangement of a plurality of angularly spaced axially extending and axially overlapping cost count increment graduations representing larger and smaller cost count increments respectively, the first larger cost count increment graduations axially extending to the left of the remaining cost count increment graduations as the counter is read from the said front thereof, and a read mechanism comprising a graduation indicator and mounting means for mounting the graduation indicator adjacent to said indicia rim for reading from the said front of the counter the accumulated cost count of the first order counter wheel with its axially extending graduations, the improvement wherein the read mechanism comprises mask means having a first selective operative position masking from the said front of the counter the said remaining cost count increment graduations only, and wherein the read mechanism mounting means is operable for selectively mounting the mask means in its said first operative position for reading with the graduation indicator and from the said front of the counter, the accumulated cost count of the first order counter wheel with the said first cost count increment graduations and without the said remaining cost count increment graduations.

4,347,436

PHOTOELECTRIC TRANSDUCING ELEMENT WITH HIGH POLYMER SUBSTRATE

Tadaji Fukuda; Masao Sugata, both of Kawasaki; Takashi Nakagiri, Tokyo, and Masaki Konishi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

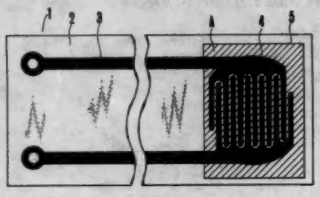
Filed Mar. 25, 1980, Ser. No. 134,150
Claims priority, application Japan, Mar. 26, 1979, 54-35257
Int. Cl.³ H01J *40/14*
U.S. Cl. 250—211 R **5 Claims**

1. In a photoelectric transducing element formed on a flexible high polymer insulating film substrate, the improvement comprising:

a conductor layer which is printed on one surface of said high polymer insulating film substrate and comprising at least a pair of independent conductor patterns; and

a photoelectric transducing layer comprising amorphous photoconductive thin film formed by a thin film forming

means with a portion thereof being superimposed on the patterned portion of said conductor layer and the remaining portion thereof contacting the plane of the high polymer insulating film substrate.

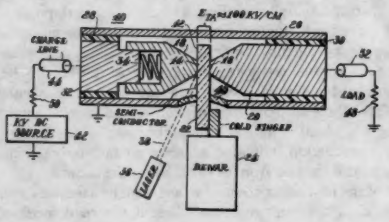


4,347,437

LIGHT ACTIVATED SWITCHING BY THE AVALANCHE EFFECT IN SEMICONDUCTORS

Gerard Mourou, Rochester, N.Y., assignor to The University of Rochester, Rochester, N.Y.

Filed Jun. 17, 1980, Ser. No. 160,351
Int. Cl.³ H01J 40/14
U.S. Cl. 250—211 R 36 Claims



1. The method of switching high voltages with the aid of a body of semiconductive material which comprises the steps of applying, with said voltage to be switched, an electrical field across said body having a predetermined magnitude below that for bulk dielectric breakdown therein, and applying optical energy to said body of levels in such relationship to said predetermined field magnitude that conduction by avalanche multiplication occurs in said body and enables switching therethrough.

4,347,438

LIGHT TRANSCEIVER DEVICE

Richard Spielman, 4401 W. Pratt Ave., Lincolnwood, Ill. 60646

Division of Ser. No. 5,002, Jan. 22, 1979, abandoned. This application Mar. 9, 1981, Ser. No. 241,674
Int. Cl.³ G01V 9/04
U.S. Cl. 250—221 9 Claims

1. An improved light transceiver for transmitting and receiving a light beam along a predetermined light path, said transceiver comprising:

a frame having spaced apart side members,

one of said side members including an enclosure and having an opening aligned with said path but otherwise being light tight,

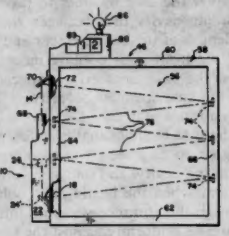
a light source for emitting a light beam and being located within said enclosure,

an aperture in said enclosure to permit passage of light from said source toward said other side member,

light receiver means secured within said enclosure including an active element to receive said light, said element being offset from said opening,

light directing mirror means on said other side member for receiving the light beam from said source and directing it along said path into said opening in the enclosure, and

light reflecting means secured within said enclosure offset from said element and aligned with said opening, said light path and said element for directing light passing trough said opening from said source to said active element, said reflecting means directing substantially all light received at an angle from said path to positions around and away from said receiver active element.

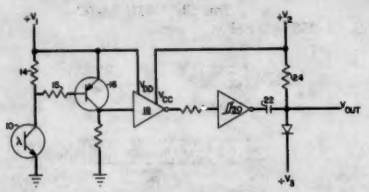


4,347,439

LEVEL-SHIFT AND PULSE SHAPING CIRCUITRY

Stanley E. Wood, Inyokern, and Kenneth L. Moore, China Lake, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 811,742, Jun. 30, 1977, abandoned. This application Feb. 1, 1979, Ser. No. 8,644
Int. Cl.³ G01V 9/04
U.S. Cl. 250—222 R 5 Claims



1. A light detection device for measuring motion of an object comprising:

a lamp for emitting light;

a collimator with a plurality of slots spaced a predetermined distance from said lamp for transmitting light from a predetermined direction from said lamp such that passage of an object through said space between said lamp and collimator sequentially cuts off transmitted light through said slots of said collimator; and

a plurality of level-shift and pulse shaping circuits with a phototransistor per circuit, said phototransistors connected to respond near their maximum output voltage thus permitting logic level, TTL level, connections placed on the opposite side of said slotted collimator from said lamp such that each phototransistor monitors the transmitted light from a predetermined group of slots in said collimator.

4,347,440

FILTER ARRANGEMENT FOR AN X-RAY APPARATUS

Werner Haas, Lafayette, Calif., assignor to Siemens Medical Laboratories, Inc., Walnut Creek, Calif.

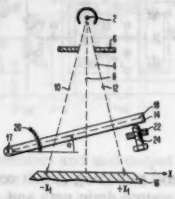
Filed Jul. 9, 1980, Ser. No. 166,805
Int. Cl.³ G21F 3/02; G21K 3/00
U.S. Cl. 378—156 12 Claims

1. A filter arrangement for an X-ray apparatus having an

X-ray source for emitting X-rays, and a collimator for forming a bundle from said X-rays and for directing said bundle of X-rays onto a target, said bundle of X-rays defining a center beam axis, comprising

(a) a single filter plate having a first and a second end face which are opposed to each other, said filter plate being positioned in said bundle for passing said X-rays therethrough and for attenuation of said X-rays before their impingement on said target;

(b) means for pivotally mounting said filter plate on a pivoting axis which is non-parallel to said center beam axis and



for rotating said filter plate about said pivoting axis between a lower setting angle and an upper setting angle into a plurality of selected positions, wherein said two setting angles determine the setting range of said filter plate, such that in said whole setting range said first end face is always exposed to said entire bundle of X-rays, said entire bundle thereby passing through said filter plate and exiting through said second end face, thereby obtaining selected non-uniform radiation profiles of said X-rays transmitted to said target; and

(c) means for locking said filter plate in a selected position within said setting range.

4,347,441

DUAL PROBE INTERFEROMETER FOR OBJECT PROFILE MEASURING

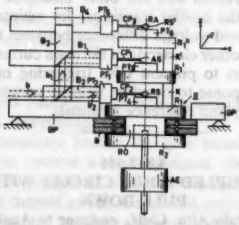
Jan G. Dil; Johannes C. Driessen, and Wichert Mesman, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 6, 1980, Ser. No. 193,972

Claims priority, application Netherlands, Sep. 22, 1980, 8005259

Int. Cl.³ G01N *21/86*

U.S. Cl. 250—560 **8 Claims**



1. An apparatus for measuring the profile of an object, which apparatus comprises a rotatable measuring table for the object, a measuring probe having one end which is adapted to be pressed against the object and a second end carrying a reflecting element, and an interferometer, whose measuring arm incorporates the reflecting element of the measuring probe, characterized by a reference table for a reference object, which reference table is rotatable in synchronism with and about the same axis as the measuring table, a reference probe, having one end which is adapted to be pressed against the reference object, and a second end carrying a reflecting element which is incorporated in the reference arm of the interferometer.

4,347,442

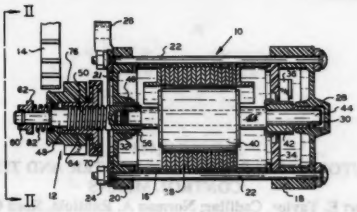
DOUBLE INSULATED STARTER MOTOR

Dale A. White, Eaton Rapids; Paul P. Kluwe, Vermontville, and Leon D. Greenwood, Eaton Rapids, all of Mich., assignors to Eaton Stamping Company, Eaton Rapids, Mich.

Filed Jul. 14, 1980, Ser. No. 168,135

Int. Cl.³ F02N *11/14*

U.S. Cl. 290—48 **15 Claims**



1. A starter for internal combustion engines characterized by its dielectric nature and economy of construction comprising, in combination, a synthetic plastic tubular casing having an inner surface and ends, a synthetic plastic end cap mounted on each casing end, connector means mounting said end caps upon said casing, a bearing mounted in each of said end caps, an electric field coil mounted within said casing having a diameter slightly less than the diameter of said casing inner surface, armature shaft structure supported on said bearings including a cantilever portion extending exteriorly of an end cap and a coaxial interior portion within said casing, an armature defined on said shaft structure interior portion within said field coil, armature brushes within said casing energizing said armature, said armature shaft cantilever and interior portions comprising separate interconnected shafts, connection means interconnecting said cantilever and interior portion shafts providing an integral armature shaft structure assembly, and starter pinion gear means mounted upon said cantilever portion.

4,347,443

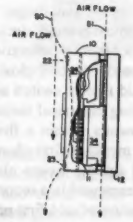
ROOM THERMOSTAT WITH ELECTRONIC CIRCUIT BOARD HEAT REMOVAL AIR WASH

John M. Whitney, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 18, 1981, Ser. No. 275,003

Int. Cl.³ H01H *35/14*; H02B *1/00*

U.S. Cl. 307—117 **11 Claims**



1. A thermostat comprising

a base member adapted to be mounted on a wall of a space in which the temperature is to be controlled,

a cover member,

a circuit board means for supporting electrical components

of an electrical circuit on a front side of said board means, said components including a temperature responsive element, a power supply circuit, a signal output circuit,

means for mounting said circuit board in said cover member with space between the back side of said circuit board and said cover to allow air to flow over said circuit board to remove heat therefrom,

shield means attached to said front side of said circuit board to shield said temperature responsive element from heat generated in said power supply circuit and signal output circuit, and

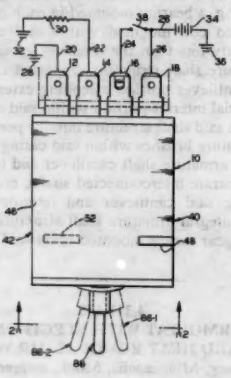
means connecting said circuit board means to said base member.

4,347,444

AUTOMOTIVE BACKLIGHT HEATER AND TIMING CONTROL MEANS

Robert E. Taylor, Cadillac; Norman A. Rautiola, Reed City, and Gerald K. Miller, Hersey, all of Mich., assignors to Nartron Corporation, Reed City, Mich., a part interest

Filed Feb. 7, 1980, Ser. No. 119,214
Int. Cl.³ H01H *43/00*
U.S. Cl. 307—141 **93 Claims**



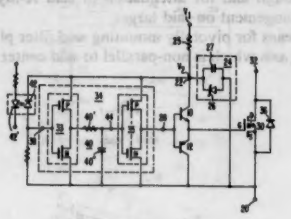
1. An electrical switching and timing assembly, comprising first switch means selectively electrically closable and openable, circuit means having an input end and an output end, said input end being adapted for electrical connection to a master switch assembly and through said master switch assembly to a source of electrical potential, said output end being adapted for electrical connection to associated electrical load means, said circuit means being closable by selective closing of said first switch means only if said selective closing of said first switch means occurs when said master switch assembly is closed, said circuit means comprising electrical timing means effective for opening said circuit means within a first preselected span of time after said circuit means is first closed by said first switch means, said electrical timing means also being effective for opening said circuit means within a second predetermined span of time after the expiration of said first preselected span of time and upon said circuit means being again closed by said first switch means, said second preselected span of time being different from said first preselected span of time, and wherein said first switch means is effective for opening said circuit means even before the expiration of either of said preselected spans of time.

4,347,445

FLOATING HYBRID SWITCH

Richard H. Baker, Bedford, Mass., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 31, 1979, Ser. No. 108,523
Int. Cl.³ H03K *17/687, 19/092*
U.S. Cl. 307—255 **9 Claims**



1. A floating hybrid switching circuit comprising a VMOS transistor having a source drain path and a gate electrode, a pair of complementary series connected bipolar transistors having common base input electrodes and common output electrodes, the common output electrodes having the same nomenclature and being d.c. coupled to the gate electrode, said series transistors having a main current path between a power supply terminal and a floating reference terminal, said reference terminal being d.c. connected to one electrode of the field effect transistor source drain path and one electrode of the main path of the series transistors to maintain said one electrode at the same floating d.c. reference potential, a control circuit for deriving an output signal coupled to the common base electrodes, said output signal having first and second levels respectively causing a main current path of a first of the bipolar transistors to be cut off while a main current path of the second bipolar transistor is conducting and the main current path of the first bipolar transistor to be conducting while the main current path of the second bipolar transistor is cut off, the bipolar transistors when responsive to the first level maintaining the gate electrode at a predetermined constant voltage relative to the reference terminal via a low impedance path between the reference terminal and the gate electrode to cut off the VMOS transistor source drain path and when responsive to the second level coupling the voltage at the other electrode of the bipolar transistor main current path to the gate electrode to activate the VMOS transistor source drain path into a conducting state, and diode means connected between the reference terminal and the other electrode of the main current path of the bipolar transistors for maintaining a constant predetermined voltage difference between the reference terminal and the other electrode of the main current path of the bipolar transistors to prevent false triggering of the bipolar transistors in response to transient voltage variations between the power supply and reference terminals.

4,347,446

EMITTER COUPLED LOGIC CIRCUIT WITH ACTIVE PULL-DOWN

John E. Price, Palo Alto, Calif., assignor to Amdahl Corporation, Sunnyvale, Calif.

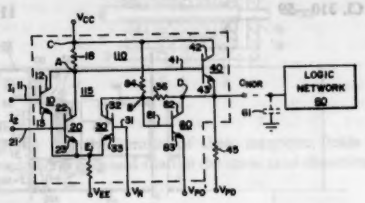
Filed Dec. 10, 1979, Ser. No. 101,466
Int. Cl.³ H03K *19/086, 19/092*
U.S. Cl. 307—443 **12 Claims**

1. In a logic system, an emitter coupled logic circuit comprising:

input difference circuit means including first and second difference circuit branches having respective first and second switching transistors with opposite operating states switching in response to at least one input logic signal and associated first and second load circuits and first and second output nodes;

emitter-follower transistor circuit means coupled to one of said output nodes of said switching transistors for sensing the operating state thereof and producing an output logic signal corresponding thereto on an output signal node; and

transition circuit means including a transition transistor coupled between the other one of said output nodes of said



switching transistors and said output signal node for providing large current drive to said output signal node during each transition of said output logic signal in one direction and bias circuit connections for said transition transistor directly incorporating at least a portion of an associated one of said load circuits in a manner such that said transition transistor operates only during said output logic signal transitions in said one direction.

4,347,447

CURRENT LIMITING MOS TRANSISTOR DRIVER CIRCUIT

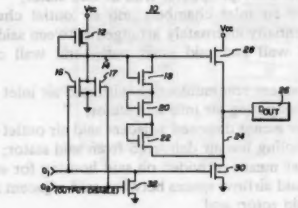
Robert J. Proebsting, Carrollton, Tex., assignor to Mostek Corporation, Carrollton, Tex.

PCT No. PCT/US81/00497, § 371 Date Apr. 16, 1981, § 102(e) Date Apr. 16, 1981

PCT Filed Apr. 16, 1981, Ser. No. 275,056

Int. Cl.³ H03K *19/003, 19/007, 19/094, 17/16*

U.S. Cl. 307—548 **15 Claims**



1. A current limiting MOS transistor circuit for driving an output node, comprising:

a driver transistor having the gate terminal thereof connected to receive a control signal, the drain terminal thereof connected to a power terminal, and the source terminal thereof connected to said output node, and

means connected between the gate and source terminals of said driver transistor for limiting the maximum voltage difference therebetween to a predetermined voltage thereby limiting the current flow through said driver transistor, wherein said means for limiting comprises a plurality of serially connected transistors each having the gate and drain terminals thereof connected together, the first of said transistors having the gate and drain terminals thereof connected to the gate terminal of said driver transistor, each succeeding transistor having the gate and drain terminals thereof connected to the source terminal of the preceeding transistor and the last of said transistors having the source terminal thereof connected to the source terminal of said driver transistor.

4,347,448

BUFFER CIRCUIT FOR SEMICONDUCTOR MEMORY

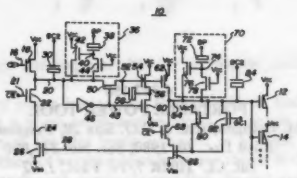
Robert S. Plachno, Carrollton, Tex., assignor to Mostek Corporation, Carrollton, Tex.

PCT No. PCT/US80/01495, § 371 Date Nov. 7, 1980, § 102(e) Date Nov. 7, 1980, PCT Pub. No. WO82/01795, PCT Pub. Date May 27, 1982

PCT Filed Nov. 7, 1980, Ser. No. 265,984

Int. Cl.³ H03K *17/284, 17/16, 17/687*

U.S. Cl. 307—583 **21 Claims**



1. A circuit for controlling a plurality of power transfer transistors, comprising:

means responsive to a first enable signal for charging a node which is connected to control the state of said power transfer transistors;

means responsive to a second enable signal for coupling said node to a reference voltage and for discharging said node to a predetermined voltage;

means responsive to a first clock signal for isolating said node from said reference voltage; and

means for coupling a negatively going clock signal to said node to drive said node to a voltage below said predetermined voltage whereby said power transfer transistors are rendered nonconductive.

4,347,449

PROCESS FOR MAKING A MAGNETIC ARMATURE OF DIVIDED STRUCTURE AND ARMATURE THUS OBTAINED

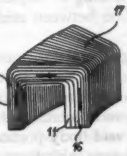
Jean-Francois Beau, Saint-Ouen l'Aumone, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Mar. 6, 1980, Ser. No. 127,830

Claims priority, application France, Mar. 20, 1979, 79 07021

Int. Cl.³ H02K *15/02*

U.S. Cl. 310—42 **9 Claims**



1. A process for forming a magnetic armature having an annular shape and a concentric annular groove defined in part by concentric inner and outer radial rings, said inner ring having a radial thickness greater than that of said outer ring, said process comprising the steps of:

winding a filamentary magnetic material on an annular mandrel having a cross-section on one side of a plane at right angles to the axis of said mandrel, which cross-section corresponds in part to the cross-sectional contour of said groove, to produce a toroidal winding having an outer

shape on said side of said plane which at least approximately corresponds to the desired outer shape of said armature;

impregnating said winding with a hardenable material capable when hardened of joining together the turns of said winding;

hardening said material; and

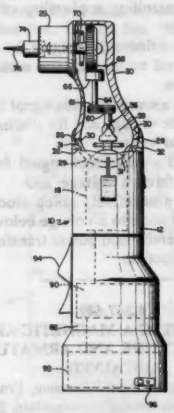
cutting said winding along said plane to form said armature.

4,347,450

PORTABLE POWER TOOL

Wallace M. Colligan, Rte. 1, P.O. Box 28, Preston, Md. 21655

Filed Dec. 10, 1980, Ser. No. 215,090
Int. Cl.³ H02K 7/14; F16C 1/02
U.S. Cl. 310—50 13 Claims



1. A portable power tool comprising:

an elongated body portion having ends;

power means in said body portion;

a heat portion adjacent one end of said body portion, said head portion including an implement holding chuck;

a driving connection between said power means and said chuck; and

means for allowing pivotal displacement of said head portion with respect to said body portion between a normal, aligned position with respect to said body portion and displaced positions in which said head portion is inclined with respect to said body portion, said pivotal displacement allowing means including:

(i) a swivelable joint between said body portion and said head portion;

(ii) an angular coupling in said driving connection, said angular coupling being disposed adjacent said swivelable joint;

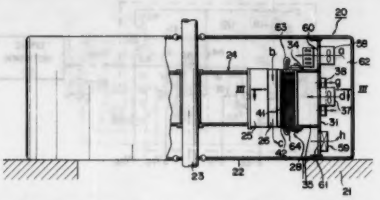
said body portion having a longitudinal axis, said head portion also having a longitudinal axis, said longitudinal axis of said head portion normally being parallel with said longitudinal axis of said body portion when said head portion is in said normal, aligned position, and wherein said chuck has a rotational axis which is normal to the axis of said head.

4,347,451

SALIENT POLE DYNAMOELECTRIC MACHINE

Akinori Mizuyama, Komae, and Tadahisa Ogita, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 18, 1980, Ser. No. 141,659
Claims priority, application Japan, Apr. 25, 1979, 54-50252
Int. Cl.³ H02K 9/04
U.S. Cl. 310—59 11 Claims



1. A salient pole dynamoelectric machine comprising:

a cylindrical housing;

a central rotary shaft disposed in the center of said housing;

a rotor rotatably disposed in said housing on said central rotary shaft having an outer peripheral wall fitted with a plurality of circumferentially arranged adjacent salient poles and having airflow spaces defined between said adjacent salient poles;

a stator having an outer peripheral wall and an inner peripheral wall and disposed in said housing to concentrically surround said rotor, wherein said stator inner peripheral wall is fitted with circumferentially arranged stator coils having stator coil ends extending beyond said stator inner peripheral wall;

a cylindrical partition wall which further comprises a cylindrical base wall circumferentially spaced a prescribed distance from said inner peripheral wall of said stator and a plurality of annular rims formed on both a top and bottom end of said cylindrical base wall, said cylindrical base wall and said annular rims cooperating to completely enclose said inner peripheral wall of said stator;

a plurality of air inlet chambers and air outlet chambers circumferentially alternately arranged between said outer peripheral wall and said inner peripheral wall of said stator;

first blower means communicating with said air inlet chambers for conducting air into said stator;

first air cooler means disposed adjacent said air outlet chambers for cooling hot air delivered from said stator;

second blower means provided on said housing for supplying air to said airflow spaces between said adjacent salient poles of said rotor; and

second air cooler means provided on said housing for cooling hot air drawn from said airflow spaces defined between said adjacent salient poles of said rotor.

4,347,452

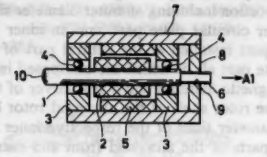
MICRO-DISPLACEMENT DEVICE

Issei Imahashi, Yamanashi, Japan, assignor to Telmec Co., Ltd., Japan

Filed Sep. 15, 1980, Ser. No. 187,170
Claims priority, application Japan, Mar. 5, 1980, 55-27614
Int. Cl.³ H02K 7/12
U.S. Cl. 310—76 2 Claims

1. A backlash free micro-displacement device comprising a rotary shaft fixedly secured along a center axis of a rotor of a step motor and having screw threads formed around its outer periphery, bearings fixedly secured to a casing for supporting said rotary shaft so as to be rotationally and axially displaceable, a stator of the step motor provided on said casing for rotationally driving said rotor, and a nut provided on said casing and threadedly engaging the screw threads around said

rotary shaft said rotor in all axial positions of said shaft being axially offset in the same direction with respect to said stator with the respective magnetic fields of said rotor and stator



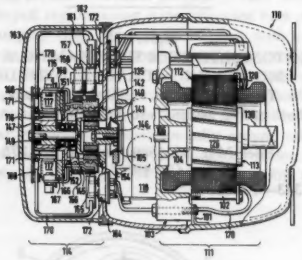
overlapping and the centers of their magnetic fields being staggered and urging said shaft in the same axial direction at all times.

4,347,453

DIRECT CURRENT MOTOR WITH MAGNETIC COUPLING

Ernst Gaus, Bürg rasse 9, 7500 Karlsruhe, Fed. Rep. of Germany

Filed Feb. 6, 1980, Ser. No. 118,983
Int. Cl.³ H02K *49/00*
U.S. Cl. 310—104 13 Claims



1. A direct-current motor particularly for driving compressors in refrigeration aggregates, comprising a housing; a stator in said housing; a rotor in said housing concentrically surrounded by said stator and defining an annular clearance therewith, said rotor including an output shaft; commutator means in said housing; a magnetic coupling in said housing intermediate said rotor and said commutator means for transmitting rotation to the latter, said coupling including two magnetically coupled discrete rotatable elements one of which is driven by said rotor and the other of which drives said commutator means; and means hermetically subdividing said housing into two compartments one of which contains said stator, rotor and one of said rotatable members whereas the other compartment contains said commutator means and the other of said rotatable elements; said output shaft extending through said subdividing means for said other compartment into direct driving connection with an aggregate to be driven, torque required for driving said commutator means being transmitted indirectly by said magnetic coupling.

4,347,454

STATOR WINDING FOR AN ELECTRIC MACHINE

Klaus Gellert; Günter Nagel, and Franz J. Pollmeier, all of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 16, 1979, Ser. No. 67,145
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1978, 2836229
Int. Cl.³ H02K *19/26*
U.S. Cl. 310—193 2 Claims

1. A stator winding assembly for an electric machine comprising:

a stack of stator laminations formed with at least one slot having a given cross-section along its length, the cross-section of the slot being enlarged at at least one point along the slot to provide at least one recess in the laminations, each such recess surrounding the slot and bounded on its sides and bottom by the lamination stack; and

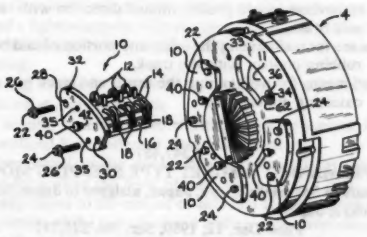
a winding inserted in the slot, the winding comprising at least one insulated conductor having a protective outer corona coating, and at least one portion of the winding, at at least one point corresponding to the position of a recess having an enlarged cross-section comprising a wrapping of insulating tape adapted to engage and lock in the recess to secure the winding against motion in the axial directon.

4,347,455

REMOVABLE BRUSH HOLDER WITH BRUSH CLAMPING DEVICE

Jeffrey T. Major, Cygnet; LeRoy A. Yard, Oregon, and Danny B. Holzscheiter, Toledo, all of Ohio, assignors to Eltra Corporation, Toledo, Ohio

Filed Apr. 18, 1980, Ser. No. 141,539
Int. Cl.³ H02K *13/00*
U.S. Cl. 310—239 3 Claims



1. In a dynamoelectric machine having an armature contact surface, and an end frame, the combination comprising:

a plurality of separate removable brush holders adapted to be axially removable from the exterior of said machine, said end frame of said machine having apertures therethrough adapted to receive each said brush holder therein;

said end frame including means for receiving attachment each means for attaching said brush holder to said end frame;

means for making electrical connection to said brush holder;

each said removable brush holder including manually operable means for retaining a brush in a predetermined position therein and releasing said brush after said brush holder is firmly attached to said end frame, and for retaining said brush in a second predetermined position and releasing said brush after said removable brush holder is removed from

said end frame by manually tilting said brush holder; so that each said brush holder is adapted to be tilted to avoid contact with said armature contact surface while being passed through said aperture, and said brush holder being adapted to retain said brush in a position removed from said contact surface during movement of said brush holder with respect to said armature contact surface until said movement has ceased; said manually operable means being a threaded member;

said brush holder defines a threaded aperture therein, adapted to adjustably retain said threaded member therein;

said threaded member being inserted into said brush holder so that a tip thereof presses against said brush, causing said brush to be retained in a predetermined position in said brush holder.

4,347,456

SLIDING ELECTRICAL CONTACT DEVICES

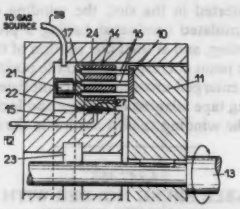
Jean-Pierre Chabrerie, Gif-sur-Yvette, France, assignor to Etat Francais, Paris, France

Continuation of Ser. No. 944,860, Sep. 22, 1978, abandoned. This application Jul. 7, 1980, Ser. No. 166,366

Claims priority, application France, Oct. 3, 1977, 77 29716

Int. Cl.³ H02K *13/00*

U.S. Cl. 310—248 **11 Claims**



1. An electrical contact device for current transfer comprising:

a brush having at least one bundle of stiff wholly metal wires of a diameter less than 80 microns and sole means with which one end portion of said bundle has a tight connection retaining said end portion in a predetermined direction with respect to said sole means,

a track arranged to be moved in operation in a direction transverse to said predetermined direction with respect to said brush,

means for maintaining the other end portion of said bundle in rubbing contact with the track,

and means for maintaining the brush and track in a dry non oxidizing atmosphere.

4,347,457

PERMANENT MAGNET TYPE STEPPING MOTOR

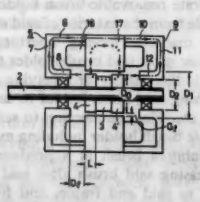
Masafumi Sakamoto, Kiryu, Japan, assignor to Japan Servo Co., Tokyo, Japan

Filed Dec. 12, 1980, Ser. No. 215,717

Claims priority, application Japan, Sep. 19, 1980, 55-129216

Int. Cl.³ H02K *3/42*

U.S. Cl. 310—256 **2 Claims**



1. A permanent magnet type stepping motor that is characterized in having a rotor made of a circular-plate permanent magnet with one side magnetized as N-pole and the other side as S-pole sandwiched between two rotor yokes made of magnetic circular plate and mounted in one unit on a rotor shaft by way of a hole penetrating through its center, a cover comprising a front portion including an outer diameter side cylindrical part, a cover circular plate part, and an inner diameter side cylindrical part installed at the central part of the aforesaid circular plate part all of which are composed in one unit and made of magnetic material and a rear cover of the same construction, the rotor shaft of the aforesaid rotor being held by the inner diameter sides of the respective inner diameter side cylindrical parts of the aforesaid front and rear covers such that the rotor rotates freely, a stator firmly held by binding bolts and nuts between the aforesaid front and rear covers arranged in a position where its inner surface opposes the outer periphery of the aforesaid rotor yokes across a small air gap, toothed wheel-like jags fabricated around the outer periphery of the aforesaid rotor yokes opposing the inner surface of the stator to facilitate the rotor to make a stepwise rotation by letting a stepwise DC current flow through the stator coils wound around the aforesaid stator, wherein with D_1 for the outer diameter and D_2 for the inner diameter respectively of the inner diameter side cylindrical parts of the aforesaid front cover and rear cover respectively, D_0 for the outer diameter of the rotor yokes, L for the respective length of the rotor yokes in the shaftwise direction, Gl for the dimension of the air gap between the outer periphery of the rotor yokes and the inner surface of the stator, Dl for the distance of space between the end surface of the inner diameter side cylindrical parts respectively of the front cover and the rear cover and the opposing end surface of the rotor yokes, and n for any optional number, by satisfying the following relationship

$$Dl/Gl > n \cdot (D_1^2 - D_2^2)/(4D_0 \cdot L),$$

the magnetic flux leaking outside the motor is controlled to less than 1/n of the effective magnetic flux.

4,347,458

PHOTOMULTIPLIER TUBE HAVING A GAIN MODIFYING NICHROME DYNODE

Charles M. Tomasetti, Leola, and John A. Ulaky, Washington Boro, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 26, 1980, Ser. No. 134,276

Int. Cl.³ H01J *43/00*

U.S. Cl. 313—103 R **5 Claims**

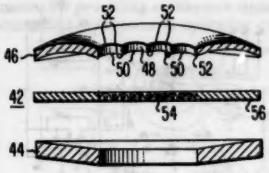
1. An electron discharge multiplier device including an evacuated envelope having therein a photocathode, an anode, and a plurality of dynodes for propagating and concatenating electron emission from said photocathode to said anode, each of a plurality of said dynodes consisting of a supporting substrate having a secondary emissive material on an exposed surface thereof, and at least one of said dynodes being adjacent to said anode and comprising nichrome whose exposed surface is substantially devoid of secondary emissive material to provide gain reduction and stability.

4,347,459

MESH ASSEMBLY HAVING REDUCED MICROPHONICS FOR A PICK-UP TUBE

Timothy E. Benner, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 31, 1980, Ser. No. 202,769
Int. Cl.³ H01J 29/08, 31/38
U.S. Cl. 313—383 7 Claims



1. In a pick-up tube having a generally cylindrical envelope, a faceplate at one end of said envelope, a photoconductive target electrode adjacent to said faceplate, a cathode in the other end of said envelope and a mesh assembly disposed in spaced relation adjacent to said target electrode between said target electrode and said cathode, the improvement wherein said mesh assembly comprises:

a mesh electrode disposed between an annular mesh support ring and an annular mesh damping ring, said mesh damping ring having a substantially bow-shaped cross-section extending from the inner periphery of said damping ring to the outer periphery thereof, said damping ring being fixedly attached at a plurality of spaced points around its outer periphery to said mesh electrode and to said mesh support ring, said inner periphery of said damping ring being formed into a plurality of arcuately shaped regions extending around said inner periphery, each of said arcuately shaped regions being interconnected by a portion of said damping ring which is in contact with said mesh electrode, the annular region between said inner periphery and said outer periphery of said bow-shaped damping ring and the axially extending region between said damping ring and said mesh electrode forming a vibration damping chamber extending circumferentially around said assembly and having a plurality of entrances formed by said arcuately shaped regions of said mesh damping ring.

4,347,460

COMPACT FLUORESCENT LAMP ASSEMBLY

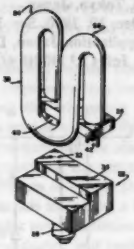
Frank M. Latassa, Magnolia, and John G. Ray, Topsfield, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 3, 1980, Ser. No. 126,818
Int. Cl.³ H01J 25/50, 13/46, 19/78; H01K 1/62
U.S. Cl. 315—63 7 Claims

1. A fluorescent lamp assembly for use with an incandescent fixture, said assembly comprising:

a first housing containing a ballast for said lamp and having a screw-in, incandescent type base projecting from one surface thereof and a pair of contact receiving means on another surface thereof; and

a second housing including lamp starting means, a fluorescent lamp having a given effective length projecting



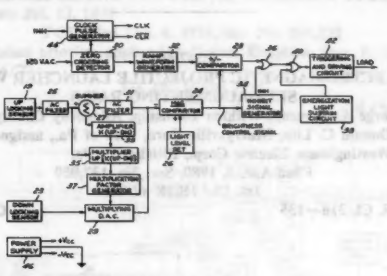
therefrom and a pair of contacts for mating with said pair of contact receiving means.

4,347,461

INCIDENT ILLUMINATION RESPONSIVE LIGHT CONTROL

Randolph S. Carlson, Irvine, Calif., assignor to Robert L. Elving, Anaheim, Calif.

Filed Oct. 23, 1980, Ser. No. 199,825
Int. Cl.³ H05B 37/02
U.S. Cl. 315—158 14 Claims



1. An illumination level control system for controlling the output of a light source in response to measurements of natural light, artificial light, and surface reflections in a given area, comprising:

first sensing means for determining the level of artificial light produced at a given source;

second sensing means for determining levels of natural light and artificial light reflected from said given area;

means connected to the output of said second light sensing means for scaling the level of said output;

means responsive to the output of said first sensing means and that portion of the output of said scaling means representing light reflected from said given source for producing a signal which is proportional to the difference between said outputs;

means responsive to said proportional signal and connected to said scaling means for changing the scaling factor of said scaling means in proportion to the value of said proportional signal;

means for providing a reference signal representing a predetermined desired light level;

means responsive to said reference signal and the output of said scaling means for producing a control signal representing the combined values of said reference signal and said scaled output signal; and

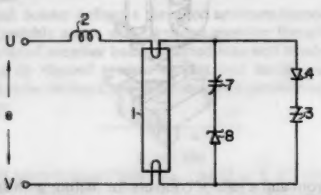
means responsive to said control signal and connected to an illumination source for controlling said illumination source to produce light at a level proportional to the value of said control signal.

4,347,462

DISCHARGE LAMP LIGHTING DEVICE

Hiromi Adachi, Kamakura, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1980, Ser. No. 218,151
Claims priority, application Japan, Dec. 27, 1979, 54-170768
Int. Cl.³ H05B 41/16
U.S. Cl. 315—290 4 Claims



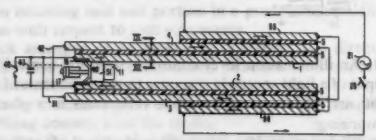
1. A discharge lamp lighting device comprising: a discharge lamp; an inductive stabilizer connected in series with said discharge lamp; a nonlinear capacitor; semiconductor switch means connected in parallel with said discharge lamp; a Zener diode connected in series with said nonlinear capacitor with the series connected nonlinear capacitor and Zener diode coupled in parallel with said discharge lamp.

4,347,463

ELECTROMAGNETIC PROJECTILE LAUNCHER WITH SELF-AUGMENTING RAILS

George A. Kemeny, Wilkins Township, Allegheny County, and Donald C. Litz, Murrysville Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 3, 1980, Ser. No. 137,059
Int. Cl.³ H02K 41/00
U.S. Cl. 318—135 23 Claims



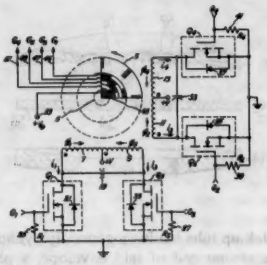
1. An electromagnetic projectile launcher comprising:
a first conductor;
a second conductor disposed generally parallel to said first conductor;
means for propelling a projectile from one end of the first and second conductors to the other end thereof and for conducting current therebetween;
a third conductor disposed generally parallel and adjacent said second conductor and being electrically connected to said first conductor adjacent said one end thereof;
a fourth conductor disposed generally parallel and adjacent said first conductor and being electrically connected to said second conductor adjacent said one end thereof;
a source of high current electrically connected to the other end of said third and fourth conductors; and
circuit breaking means electrically connected between the one end of said first and second conductors, whereby the current required for launching a projectile at a predetermined velocity is rapidly commutated to the first and second conductors by opening said circuit breaking means and the current is lower than that required utilizing a single pair of conductors.

4,347,464

FET MOTOR DRIVE SYSTEM

John N. Park, Rexford, and Robert L. Steigerwald, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 2, 1981, Ser. No. 239,724
Int. Cl.³ H02K 24/02
U.S. Cl. 318—254 4 Claims



1. A synchronous motor drive system comprising:
a multiphase stator having two windings per stator phase;
a shaft;
a multipole rotor affixed to said shaft, said shaft mounted for rotation in said stator;
switch means for controlling the current to each of said windings, said switch means including a field effect transistor for each winding, each said field effect transistor having a gate, a source and a drain, the drain of each field effect transistor being connected to one end of a corresponding winding, the source of each field effect transistor being connected to ground, the other end of each of said windings adapted to be connected to an external DC source, said windings being connected so that current flowing in one winding of a stator phase results in flux in the opposite direction from the flux resulting from current flowing in the other winding of the same stator phase;
distribution means having a pattern of conductive and non-conductive material mounted to turn with said shaft for determining the sequence said field effect transistors are energized; and
pick up means in contact with said distributor means for coupling an external source of gate voltage to said distributor means and for selectively coupling gate voltage to the gates of said field effect transistors dependent on the pattern of said distribution means and the shaft instantaneous position.

4,347,465

CIRCUIT ARRANGEMENT FOR POWER WINDOWS

Horst Goertler, Sachsenheim; Friedrich Hetzel, Mühlacker; Uwe Knobloch, Heilbronn-Sontheim; Hans Müller, Mühlacker-Mühlhausen; Hans Prohaska; Horst Rachner, both of Bietigheim-Bissingen, and Wolfgang Spieth, Freiberg, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jul. 7, 1980, Ser. No. 166,585
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1979, 2926938
Int. Cl.³ H02P 1/22
U.S. Cl. 318—266 1 Claim

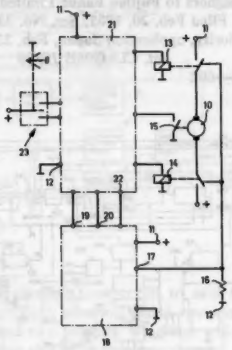
1. A safety control circuit for the electric motor of a power window for automotive vehicles which senses the motor current and differentiates between a tight fitting of the window pane and an obstacle blockage, said control circuit comprising, in combination:
first means for selectively applying and reversing operating current to said motor wherein said first means applies said operating current to said motor in a selected one of two

current directions to reverse the output motion direction of said motor and removes said operating current to stop said motor;

second means for detecting the operating current of said motor for providing a first output signal indicative thereof;

third means having an input coupled to said second means and being responsive to said first output signal for providing a second output signal indicative of the instantaneous value of said first output signal;

fourth means for providing a reference signal indicative of a predetermined instantaneous operating current level;



fifth means having a pair of inputs respectively coupled to said third and fourth means for comparing said reference signal to said second output signal and for providing a third output signal when the level of said second signal exceeds the level of said reference signal during a predetermined time period; and,

a switching element coupled between said first means and said fifth means and being responsive to said third output signal to remove or reverse said operating current from said motor when the level of said second signal exceeds the level of said reference signal during said predetermined time period.

4,347,466

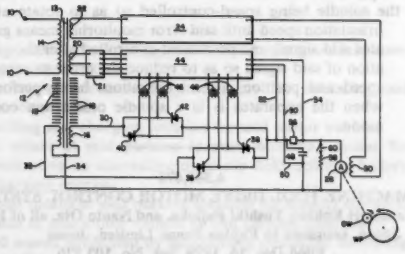
MOTOR CONTROLLING

Allen E. Ottoson, Westboro, Mass., assignor to Vee Arc Corporation, Westboro, Mass.

Continuation of Ser. No. 904,402, May 10, 1978. This application Dec. 27, 1979, Ser. No. 107,595

Int. Cl.³ H02K *27/20*

U.S. Cl. 318—301 **16 Claims**



1. A DC motor system operable in motor and generator modes and comprising:

an AC source for delivering AC power,

a DC motor having a motor field and an armature,

rectifier means including at least one pair of oppositely poled controlled rectifiers and an armature capacitor coupled from said controlled rectifiers and disposed across said armature,

said rectifier means connected to receive AC power from said AC source and to rectify said AC to DC across said armature capacitor,

controller means including means coupled from the AC source and means responsive to armature voltage magnitude for controlling the triggering of one of said controlled rectifiers to enable current flow for normal motor operation of the armature and for alternatively and mutually exclusively controlling the triggering of the other of said controlled rectifiers to enable the generator mode,

inductive reactanct means including a field conductor,

and electrical conductor means interconnecting in series said AC source, field conductor and rectifier means,

said field conductor providing a magnetic circuit leakage path coupled in series between the AC source and the rectifier means to apply power generated in the armature back into the AC source via the magnetic leakage path as well as applying power input to the armature in motoring.

4,347,467

CONTROL CIRCUIT FOR A D.C. MOTOR

Trevor C. Boxer, Birmingham, England, assignor to Lucas Industries Limited, Birmingham, England

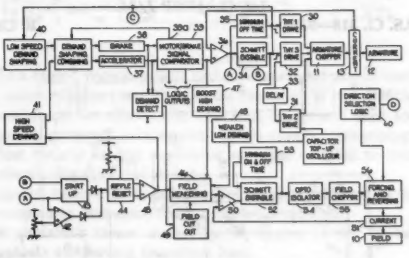
PCT No. PCT/GB78/00047, § 371 Date Jul. 23, 1979, § 102(e) Date Jul. 23, 1979, PCT Pub. No. W079/00441, PCT Pub. Date Jul. 12, 1979

PCT Filed Dec. 4, 1978, Ser. No. 224,222

Claims priority, application United Kingdom, Dec. 8, 1977, 51066/77

Int. Cl.³ H02P *5/16*

U.S. Cl. 318—317 **4 Claims**



1. A motor control circuit for a DC motor, comprising a chopper circuit with a main switch element arranged to be turned on or off to control the flow of current to the motor armature in accordance with a current demand signal applied to said chopper circuit, a field current control circuit controlling the motor field current independently of the chopper circuit, and speed compensation means for varying the current demand signal automatically to compensate for speed changes, said speed compensation means comprising a circuit responsive only to the ratio of the on and off times of the main switch element.

4,347,468

ELECTRONIC VARIABLE SPEED AUTOMOTIVE BLOWER CONTROL SYSTEM

Robert A. Wilke, Winona, Minn., assignor to Lake Center Industries, Winona, Minn.

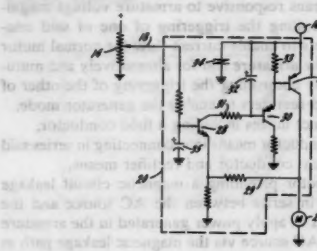
Filed Apr. 28, 1980, Ser. No. 144,339

Int. Cl.³ H02P *5/16*

U.S. Cl. 318—331 **4 Claims**

1. In a control for use with a blower motor in a heating

and/or cooling system for a car or the like, a manually operable potentiometer to provide a variable voltage and adapted to be connected to the car battery, a circuit from the potentiometer including a power transistor adapted to be connected between the car battery and the blower motor, and being the only element that drops voltage therebetween, and a voltage comparator arranged to compare the voltage from the potentiometer to the output voltage from the power transistor including a transistor with its collector connected to ground and its emitter connected to the power transistor so as to turn on the power transistor if the potentiometer voltage is higher than the power transistor output voltage and to turn off the power transistor if the potentiometer voltage is lower than the power transistor output voltage.

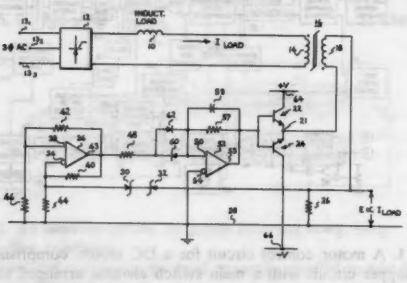


4,347,469

ELECTRONIC-MAGNETIC CURRENT ISOLATOR CIRCUIT

Edward H. Dinger, Waynesboro, Va., assignor to General Electric Company, Salem, Va.

Filed Aug. 14, 1979, Ser. No. 66,590
Int. Cl.³ H02P *1/34*
U.S. Cl. 318—533 **20 Claims**



1. An isolator circuit for providing an isolated output signal proportional to the electrical current flowing in a load supplied by a power circuit, comprising, in combination:

(a) a load coupled to said power circuit;

(b) a magnetic device including a primary and a secondary winding wound on a core structure formed from material having a substantially square loop magnetization characteristic, said primary winding being coupled to said load and responsive to the current in said load to drive the core structure in a first magnetizable direction towards saturation;

(c) an output signal impedance coupled to one end of said secondary winding and being responsive to the current flowing therein to generate said output signal; and

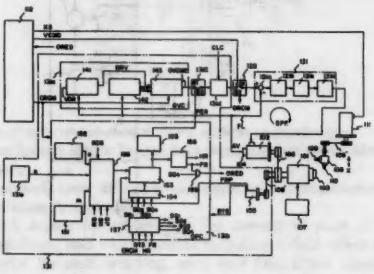
(d) control circuit means coupled between said output signal impedance and the other end of said secondary winding and being responsive to said output signal to develop and apply to said secondary winding a voltage to drive the core structure toward saturation in a second magnetizable direction opposite from said first direction, whereby an operating condition alternating between positive and negative saturation limits will be established in which current flowing in the secondary winding is proportionally related to the current flowing in the primary winding by the turns ratio between said primary and secondary windings.

4,347,470

SPINDLE ORIENTATION CONTROL APPARATUS

Yoshinori Kohzai; Yoshiki Fujioka, and Naoto Ota, all of Hino, Japan, assignors to Fujitsu Fanuc Limited, Japan

Filed Feb. 20, 1981, Ser. No. 236,623
Claims priority, application Japan, Feb. 23, 1980, 55-21817
Int. Cl.³ G05B *19/28*
U.S. Cl. 318—602 **6 Claims**



1. A spindle orientation control apparatus which comprises:

a motor for driving a spindle;

speed control means for rotating the spindle at a speed in accordance with a command speed;

position control means for stopping the spindle at a commanded spindle stopping position;

stopping position command means for digitally instructing the commanded spindle stopping position;

a position sensor for generating a one-revolution pulse each time the spindle makes one complete revolution and a position pulse each time the spindle rotates by a predetermined angle;

error monitoring means for monitoring an error between said commanded spindle stopping position and the actual rotational position of the spindle upon receiving each of the pulses generated by said position sensor, said error monitoring means generating a signal when the error attains a predetermined value; and

means for generating a signal indicative of an orientation speed;

the spindle being speed-controlled so as to rotate at the orientation speed until said error monitoring means generates said signal, and positioned-controlled after the generation of said signal so as to reduce the error to zero, the speed and position control operations being performed when the apparatus is in a spindle orientation control mode.

4,347,471

MACHINE TOOL DRIVE MOTOR CONTROL SYSTEM

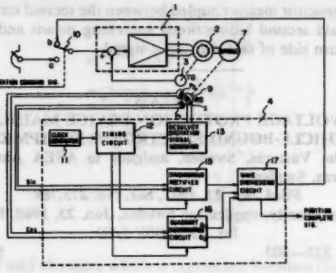
Yoshinori Kohzai; Yoshiki Fujioka, and Naoto Ota, all of Hino, Japan, assignors to Fujitsu Fanuc Limited, Japan

Filed Dec. 14, 1979, Ser. No. 103,576
Claims priority, application Japan, Dec. 16, 1978, 53-156760
Int. Cl.³ G05B *5/01*
U.S. Cl. 318—616 **5 Claims**

1. An improved control system for a machine tool of the type including a motor for driving the spindle of the machine

tool, said motor being controlled by a control unit in a speed control loop for limiting to zero the difference between a speed command signal and a speed feedback signal, wherein the improvement comprises:

positioning means for generating a position feedback signal for the input of said control unit to rigidly stop said spindle at a predetermined angular position occurring once per 360 degrees of rotation of said spindle, said positioning means including



a resolver operationally connected to said spindle and having a secondary winding which receives an excitation signal and two primary windings which generate sine and cosine signals in response thereto; and

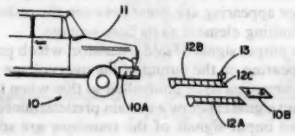
orientation control circuit means responsive to the sine and cosine signals from said resolver for synthesizing said position feedback signal, said position feedback signal comprising a monotonically changing function of angular deviation from said predetermined angular position, which function is symmetrical with respect to the points at which the deviation becomes zero.

4,347,472

APPARATUS AND METHOD FOR CHARGING A BATTERY IN A VEHICLE

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Filed Oct. 20, 1980, Ser. No. 198,724
Int. Cl.³ H02J 7/00
U.S. Cl. 320—2 **3 Claims**



1. A system for charging a battery in a motor vehicle comprising in combination:

a motor vehicle containing a battery for operating said motor vehicle,

a parking and charging location for said motor vehicle,

first means at said parking location including means for generating an alternating magnetic field defining battery charging energy,

second means at said parking location for sensing the presence of said motor vehicle at said parking location,

third means controlled by said sensing means for activating said first means to cause the generation of charging energy when said sensing means senses the presence of said motor vehicle at said parking location,

fourth means including induction means supported by said motor vehicle at a location thereon to generate charging electrical energy for said battery and means for inputting said charging electrical energy and applying same to charge the battery of said motor vehicle,

fifth means for sensing the charge of said battery of said vehicle at said parking location,

said fifth means including means for generating a short wave signal,

sixth means at said parking location for receiving said short wave signal and converting same to an electrical control signal, and

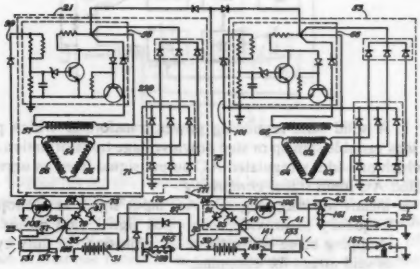
seventh means controlled by said control signal for deactivating said means controlled by said third means to substantially reduce the amount of said charging energy generated when said battery is substantially fully charged.

4,347,473

DUAL ALTERNATOR POWER SYSTEM FOR MOTOR VEHICLE

Lebern W. Stroud, 3237 Gerome, Fort Worth, Tex. 76118

Filed Apr. 26, 1979, Ser. No. 33,443
Int. Cl.³ H02J 7/14, 1/00, 3/00
U.S. Cl. 320—15 **1 Claim**



1. In a motor vehicle which includes an engine and electrically operated means employed in the operation of said vehicle and which carries electrically operated equipment used for emergency purposes, an electrical power system, comprising:

a first battery having a positive terminal coupled to said electrically operated means,

a second battery having a positive terminal adapted to be coupled to said electrically operated equipment,

first alternator means driven by the engine of said motor vehicle and having an output lead,

first and second electrical leads coupled to said output lead of said first alternator means and to said positive terminals of said first and second batteries respectively,

first and second diode means coupled to said first and second electrical leads respectively for allowing the flow of current in a direction only from said output lead of said first alternator means to said first and second electrical leads,

second alternator means driven by the engine of said motor vehicle and having an output lead,

third and fourth electrical leads coupled to said output lead of said second alternator means and to said positive terminals of said first and second batteries respectively,

third and dourth diode means coupled to said first and second electrical leads respectively for allowing the flow of current in a direction only from said output lead of said second alternator means to said third and fourth electrical leads,

first regulator means for regulating the electrical voltage applied to said first alternator means, said first regulator means having an input coupled to said output lead of said first alternator means,

second regulator means for regulating the electrical voltage applied to said second alternator means, said second regu-

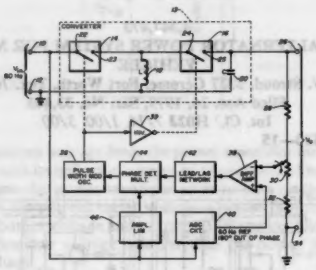
lator means having an input coupled to said output lead of said second alternator means.

4,347,474

SOLID STATE REGULATED POWER TRANSFORMER WITH WAVEFORM CONDITIONING CAPABILITY

James L. Brooks, Oxnard; Roger I. Staab, Camarillo, both of Calif.; James C. Bowers, and Harry A. Nienhaus, both of Tampa, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 18, 1980, Ser. No. 188,419
Int. Cl.³ G05F *1/445*
U.S. Cl. 323—224 9 Claims



1. A solid state regulating power transformer which provides variable step up or step down voltage transformation and which provides a regulated AC output signal from an unregulated AC input signal comprising:

a. means for chopping said AC input signal at a chopper frequency to provide a chopped signal, said means for chopping being controllable for adjusting the duty cycle of said means for chopping;

b. filter means for removing the chopper frequency from said chopped signal to provide a filtered signal, said filtered signal being said regulated AC output signal;

c. means for providing a reference signal at the frequency of said AC input signal;

d. means for providing a feedback signal derived from the filtered signal;

e. means for adjusting the gain of the transformer by providing one of means for varying the amplitude of said reference signal and means for varying the amplitude of said feedback signal;

f. means for comparing the amplitude of the reference signal with the amplitude of the feedback signal derived from the filtered signal to produce an error signal related to the difference therebetween, said error signal being coupled to said means for chopping to adjust the duty cycle of said means for chopping wherein the amplitude of said AC output signal is adjusted so that the error signal is driven toward zero and the AC output signal is regulated;

g. said means for comparing including:

differential amplifier means having a first input coupled to receive said feedback signal, a second input coupled to receive said reference signal, and an output, said differential amplifier means providing a signal related to the difference between its two inputs at its output; and

pulse-width-modulated oscillator means coupled to receive the output of said differential amplifier means for adjusting the duty cycle of said pulse-width-modulated oscillator means, the output of said pulse-width-modulated oscillator means being coupled to said means for chopping to adjust the duty cycle of said means for chopping;

h. said means for chopping and said filter means including:

a first bidirectional switching means having a first terminal and a second terminal, the signal side of said AC input signal being coupled to the first terminal of said first bidirectional switching means;

an inductor means coupled between the second terminal of said first bidirectional switching means and the return side of said AC input signal;

a second bidirectional switching means having a first terminal and a second terminal, the first terminal of said second bidirectional switching means being coupled to the second terminal of said first bidirectional switching means, and

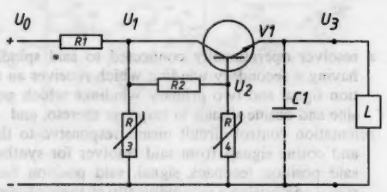
a capacitor means coupled between the second terminal of said second bidirectional switching means and the return side of said AC input signal.

4,347,475

OVERVOLTAGE PROTECTION DEVICE MAINLY FOR VEHICLE-BOUND ELECTRONIC EQUIPMENT

Ulf Ullin, Vasteras, Sweden, assignor to ASEA Aktiebolag, Vasteras, Sweden

Filed Jun. 22, 1981, Ser. No. 275,788
Claims priority, application Sweden, Jun. 23, 1980, 8004603
Int. Cl.³ G05F *5/00*
U.S. Cl. 323—303 5 Claims



1. An overvoltage protection device designed to protect electronic equipment against high energy transients, comprising:

an input to the device,

an output from the device,

a varistor arranged to have at least a part of an input signal applied to said input appear thereacross,

a voltage-dividing unit consisting of a resistor and a voltage-limiting element connected across the varistor,

a transistor arranged to receive the voltage appearing at a point between the resistor and the varistor as its input signal, and the voltage appearing at a point between the resistor and the voltage-limiting element as its base voltage,

wherein the output signal of said transistor, which provides the signal appearing on the output of the overvoltage protection device, is arranged to be controlled so that when the voltage of the input signal is below a certain predetermined level, the output and imput signals of the transistor are substantially equal, whereas when the voltage of the input signal is above said predetermined level, the output signal of the transistor is clamped so that it never exceeds the said predetermined level.

4,347,476

VOLTAGE-TEMPERATURE INSENSITIVE ON-CHIP REFERENCE VOLTAGE SOURCE COMPATIBLE WITH VLSI MANUFACTURING TECHNIQUES

Matthias L. Tam, Monterey Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 4, 1980, Ser. No. 212,783
Int. Cl.³ G05F *3/20*
U.S. Cl. 323—313 2 Claims

1. A voltage and temperature insensitive reference circuit voltage source for predetermining the proportion of supply voltage to constitute the output voltage comprising in combination:

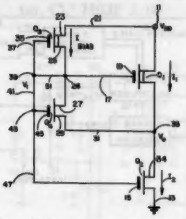
a pull-up depletion FET and a pull-down enhancement FET connected between a source of supply voltage and a reference point;

a two element biasing circuit connected between said source and the pull-down FET connected to the reference point;

said pull-up FET having a gate;

a connection from the biasing circuit at a point between said elements to said gate;

an output connection from the junction of said pull-up and pull-down FETs; and,



one of said elements which is connected between the source and the other of said elements being characterized by high resistance relative to the other of said elements whereby the proportion of voltage available at said output connection remains substantially constant regardless of source voltage variation and ambient temperature,

said other element comprising an enhancement FET matched to said pull-down FET; and,

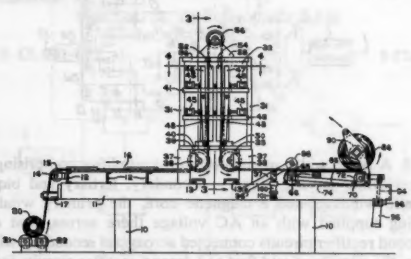
the ratio of the geometries of configuration of the pull-up FET to the pull-down FET determines said output voltage.

4,347,477

MAT TESTING APPARATUS

Clifford A. Landsness, and Thomas M. Buehrle, both of Akron, Ohio, assignors to The B.F. Goodrich Company, New York, N.Y.

Filed Aug. 15, 1980, Ser. No. 178,483
Int. Cl.³ G01R *31/12*
U.S. Cl. 324—54 **5 Claims**



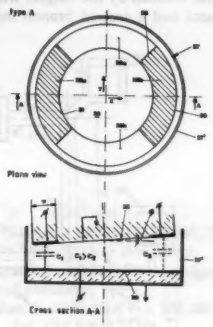
1. An apparatus for the testing of the electrical non-conductivity of a rubberized mat comprising support means having a forward portion and a rearward portion, at least two pairs of spaced flat electrode plates mounted on said support means intermediate of said forward and rearward portion, said plates are vertically disposed, power operated means mounted on said support means and interconnected to one of said plates in each of said pairs of electrode plates for moving said one plates respectively from a vertical storage position into a position closely adjacent to one of a remaining plates in each pair of plates to provide a small gap therebetween for contact with a thin mat suspended therebetween, means for applying a voltage to said one of said moveable electrode plates, and means on said support means for feeding mat material from said forward portion for windup on a take-up roll mounted on said rearward portion and for movement between said pairs of electrode plates.

4,347,478

CAPACITIVE GAUGE

Willem C. Heerens, Arnoldsonstraat 23, 2286 AG Rijswijk, Netherlands, and Gerrit H. Peerbolte, Lisztstraat 82, 2625 BL Delft, Netherlands

Filed Jul. 7, 1980, Ser. No. 166,627
Claims priority, application Netherlands, Jul. 17, 1979, 7905562
Int. Cl.³ G01R *27/26*
U.S. Cl. 324—61 R **21 Claims**



1. Capacitive sensor, comprising at least one capacitor to be connected in a bridge circuit, said capacitor having at least one of its electrode supports coated with an electrode overlay such that a system of gap-separated sub-electrodes is formed, of which at least one functions as a guard element and at least one functions as a capacitor element, if activated, said system being electro-statically shielded by a sleeve surrounding the electrode supports, characterized in that a sub-electrode (*28a*) functioning, if activated, together with a related area of an opposite electrode plate as a capacitor element, cooperates with at least another similar simultaneously activatable sub-electrode (*28b*) forming together with a related area of the opposite electrode plate another capacitor element, which sub-electrodes (*28a, b*) even if they are in a geometrical respect separated by at least a gap or similar means, yet are surrounded from all sides by sub-electrodes (**23, 29**; FIG. **6**) functioning as guard elements.

4,347,479

TEST METHODS AND STRUCTURES FOR SEMICONDUCTOR INTEGRATED CIRCUITS FOR ELECTRICALLY DETERMINING CERTAIN TOLERANCES DURING THE PHOTOLITHOGRAPHIC STEPS

Rene Cullet, Barbizon, France, assignor to International Business Machines Corporation, Armonk, N.Y.

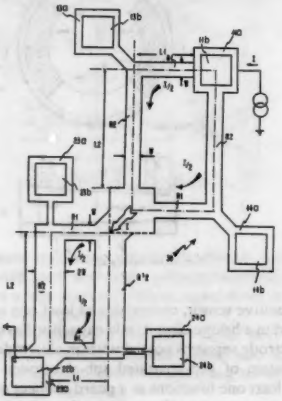
Filed Nov. 24, 1980, Ser. No. 210,081
Claims priority, application France, Jan. 9, 1980, 80 00751
Int. Cl.³ G01R *27/14, 31/00*
U.S. Cl. 324—64 **6 Claims**

1. A test structure formed in a semiconductor wafer, the wafer including semiconductor devices therein having lines made by lithographic process steps, the test structure formed in the wafer for electrically monitoring the variations in line width relative to nominal line width ($\Delta W/W$), the structure comprising:

a first resistance bridge having a first branch including at least two resistive elements, each element having a resistance value defined by the length, width and resistivity of

the element and a second branch including at least two resistive elements, each element having a resistance value defined by the length, width and resistivity of the element, the first branch electrically connected in parallel with the second branch and of a resistance value approximately equal to that of the second branch, the first branch further including means for monitoring a voltage across one resistive element in the first branch and the second branch further including means for monitoring voltage across one resistive element in the second branch so that when a current is applied to the bridge, a voltage difference (ΔV_1) between the two branches can be measured, and

a second resistive bridge having a first branch including at least two resistive elements, each element having a resistance value defined by the length, width and resistivity of the element and a second branch including at least two



resistive elements, each element having a resistance value defined by the length, width and resistivity of the element, the first branch electrically connected and parallel with the second branch and of a resistance value approximately equal to the second branch, the first branch including means for monitoring a voltage at one resistive element of the first branch and means for monitoring the voltage at one resistive element of the second branch so that the voltage difference between the two elements (ΔV_2) can be monitored when a current is applied to the second bridge whereby variation in line width relative to nominal line width ($\Delta W/W$) for lines fabricated in and on the wafer may be directly monitored by measuring the voltage difference (ΔV_1) between the first and second branches of the first bridge and the voltage difference (ΔV_2) between the first and second branches of the second bridge.

4,347,480

MAGNETIC RESONANCE GYRO PHASE SHIFTER

Lincoln S. Ferriss, Lincoln Park, N.J., assignor to The Singer Company, Little Falls, N.J.

Division of Ser. No. 931,702, Aug. 7, 1978, abandoned. This application Apr. 28, 1980, Ser. No. 144,717

Int. Cl.³ H03K *5/15, 3/86*

U.S. Cl. 328—55 **3 Claims**

1. A phase shifter comprising:

a source of input signals,

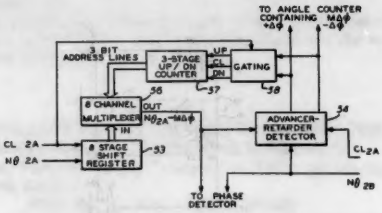
a shift register containing eight images of said input signal,

an eight channel multiplexer connected to said shift register for maintaining the phase shifted input signals within a selected monotonic range,

an advancer retarder detector connected to the output of said eight channel multiplexer for developing an electronic window for retarding the input signals which fall within said electronic window,

a gating circuit connected to the output of said advancer retarder detector, and

a three stage up/down counter connected to the output of said gating circuit and providing a three bit address to the input of said eight channel multiplexer said gating circuit operative under said advancer retarder detector to alter the con-



tents of said three stage counter whereby flip-flops in said counter determine a binary number 0 through 7 which represents closure of one of eight switches of said eight channel multiplexer, said altering of said counter causing switches in said eight channel multiplexer which were previously closed to open and causing adjacent switches which were previously open to close thereby connecting the correspondingly numbered state of said shift register to the output line of said eight channel multiplexer.

4,347,481

PULSE WIDTH MODULATED SIGNAL AMPLIFIER

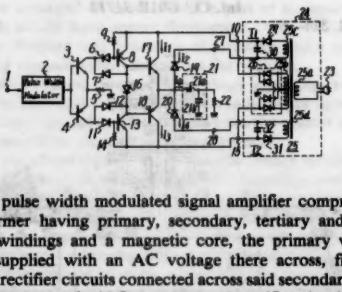
Tadao Yoshida, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 19, 1980, Ser. No. 151,266

Claims priority, application Japan, May 24, 1979, 54-64178

Int. Cl.³ H03F *3/38*

U.S. Cl. 330—251 **5 Claims**



1. A pulse width modulated signal amplifier comprising, a transformer having primary, secondary, tertiary and biquadratic windings and a magnetic core, the primary winding being supplied with an AC voltage there across, first and second rectifier circuits connected across said secondary winding, the outputs of said first and second rectifier circuits forming first and second DC voltage terminals, respectively, third and fourth rectifier circuits connected to said tertiary and biquadratic windings, respectively, the outputs of said third and fourth rectifier circuits forming third and fourth DC voltage terminals, respectively, first and second switching transistors each having a control electrode and the main current path connected in series between said first and second DC voltage terminals and their connection point connected to an output terminal, signal input means for supplying a pulse width modulated signal to the control electrodes of said first and second switching transistors, low pass filter means having an input connected to said output terminal and an output to be connected to a load, a first circuit means including a first diode means and connected between said third DC voltage terminal and said output terminal, and a second circuit means including

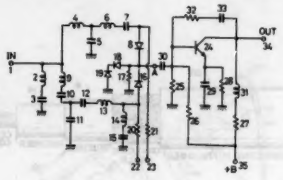
a second diode means and connected between said fourth DC voltage terminal and said output terminal.

4,347,482

AMPLIFIER EQUIPPED WITH CIRCUIT FOR PREVENTING ELECTROSTATIC BREAKDOWN

Shigeo Ohta, and Takeo Suzuki, both of Soma, Kazumic Kuwabara, Namie-Machi, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1980, Ser. No. 142,218
Claims priority, application Japan, May 2, 1979, 54-59382[U]
Int. Cl.³ H03F 3/04
U.S. Cl. 330—298 **5 Claims**



1. An amplifier equipped with a circuit for preventing electrostatic breakdown, comprising:

a resistor connected between an input terminal of the amplifier and ground;

means for applying a constant d-c voltage to said resistor; and

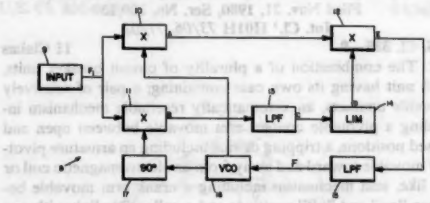
a series circuit consisting of a diode and a Zener diode, the cathodes of each of which being connected to each other, the anode of said Zener diode being grounded in parallel with said resistor, and the Zener voltage of said Zener diode being set to be greater than the voltage across the terminals of said resistor.

4,347,483

FREQUENCY AND PHASE LOCK LOOP WITH SEPARATED AFC AND PHASE LOCKING

Michael D. Flasza, Schaumburg, and Jouke N. Rypkema, Lombard, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Jul. 28, 1980, Ser. No. 172,920
Int. Cl.³ H03L 7/10
U.S. Cl. 331—12 **1 Claim**



1. An automatic phase and frequency control system for producing phase and frequency synchronization between a locally generated signal and an input signal comprising:

voltage controlled oscillator means producing said locally generated signal having a frequency responsive to a control signal;

signal generating means producing first and second beat signals between said input signal and said locally generated signal, said beat signals having a substantially quadrature relationship;

translating means converting said first beat signal to a constant amplitude signal having a phase relative to said second beat signal which varies in a predetermined relationship to the frequency of said first beat signal, said translating means being capable of coupling a DC signal;

multiplying means multiplying said second beat signal from said signal generating means and the output signal of said translating means to develop a composite correction signal, said multiplying means including a single-balanced signal multiplier capable of receiving signals of a single sign from said signal generating means and said translating means; and

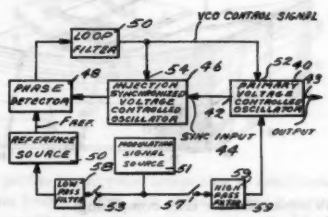
low pass filter means coupling said composite correction signal to the control signal input of said voltage controlled oscillator, said composite correction signal including the fundamental beat note frequency of said input signal and said locally generated signal.

4,347,484

SYNTHESIZER HAVING AN INJECTION SYNCHRONIZED DIVIDER

Johannes J. Vandegraaf, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Jun. 2, 1980, Ser. No. 155,386
Int. Cl.³ H03L 7/08
U.S. Cl. 331—25 **27 Claims**



1. A phase-locked loop circuit comprising:

a loop phase detector including a first signal input for coupling to a reference source, a second signal input, and a signal output for providing a signal related to the phase difference between the signals coupled to said first and second signal inputs;

a loop filter coupled to the output of said phase detector for providing a loop control signal;

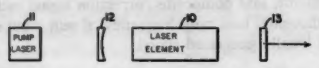
a first signal controlled frequency source including a control input coupled to said loop control signal, for providing an output signal that is frequency dependent upon said control signal; and

a second signal controlled frequency source including a first control input coupled to said loop control signal and a second control input coupled to the output of said first signal controlled frequency source for providing an output to said second signal input of said loop phase detector, said second signal controlled frequency source being synchronized, via the signal from said first signal controlled frequency source to its second control input, to a sub-harmonic of the output frequency of said first signal controlled frequency source whereby said second signal controlled frequency source functions in said phase-locked loop as a divider having a divide ratio equal to the sub-harmonic onto which it is synchronized.

4,347,485
EXCIMER-PUMPED BLUE-GREEN LASER

Leon Esterowitz, Annandale; Roger E. Allen, Alexandria, both of Va.; Melvin R. Kruer, Oxon Hill, and Filbert J. Bartoli, Upper Marlboro, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 868,360, Jan. 10, 1978, abandoned. This application May 23, 1979, Ser. No. 41,969
Int. Cl.³ H01S *3/14*
U.S. Cl. 372—42 8 Claims

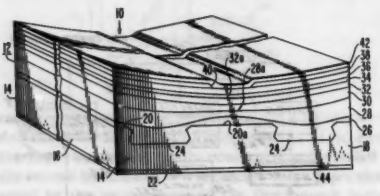


1. A solid-state laser element for obtaining blue-green radiation emission in a laser:
a rare-earth host laser crystal, said host laser crystal including therein uniformly dispersed trivalent rare-earth activator ions, and
uniformly dispersed divalent sensitizer ions.

4,347,486
SINGLE FILAMENT SEMICONDUCTOR LASER WITH LARGE EMITTING AREA

Dan Botez, Mount Holly, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 84,387, Oct. 12, 1979, abandoned. This application Apr. 6, 1981, Ser. No. 251,651
Int. Cl.³ H01S *3/19*
U.S. Cl. 372—46 20 Claims

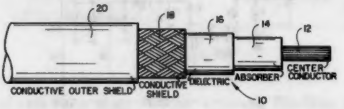


1. A semiconductor laser comprising:
a body of semiconductor material including a substrate having a surface and a pair of spaced substantially parallel dove-tail shaped grooves in said surface, said body having a pair of end surfaces between which said grooves extend, said end surfaces being reflective to light with at least one of said end surfaces being partially transparent to light,
a first confinement epitaxial layer over said surface of the substrate and the surfaces of the grooves, said first confinement layer having a flat surface portion over the portion of the substrate between the grooves,
a guide epitaxial layer over said first confinement layer,
a thin active epitaxial layer over said guide layer,
a second confinement epitaxial layer over said active layer,
said first confinement layer and guide layer being of one conductivity type and the second confinement layer being of the opposite conductivity type,
the active layer being of a material having an index of refraction greater than that of the materials of the first and second confinement layers and the guide layer being of a material having an index of refraction less than that of the material of the active layer but greater than that of the material of each of the first and second confinement layers,
the active layer being the recombination region of the laser with the light being generated therein in the vicinity of the portion which is over the flat surface portion of the first confinement layer, and
conductive contacts on said body at opposite sides of the active layer.

4,347,487
HIGH FREQUENCY ATTENUATION CABLE

Albert R. Martin, Oakland, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Nov. 25, 1980, Ser. No. 210,202
Int. Cl.³ H01P *3/06*
U.S. Cl. 333—1 9 Claims



1. A high frequency attenuation cable comprising:
a conductor;
a high frequency absorption medium for attenuating high frequency energy through the cable, the absorption medium surrounding the conductor;
dielectric surrounding the absorption medium;
electrically conductive shielding means confining high frequency energy to the absorption medium, the shielding means surrounding the dielectric; and
electrically conductive outer jacketing means preventing the shielding means from becoming a high frequency transmission line, the jacketing means surrounding the shielding means.

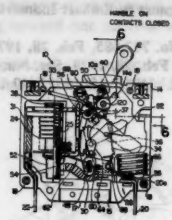
4,347,488
MULTI-POLE CIRCUIT BREAKER

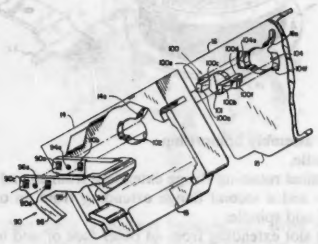
Charles Mune, West Hartford, and Bohdan Krasij, Avon, both of Conn., assignors to Carlingswitch, Inc., West Hartford, Conn.

Filed Nov. 21, 1980, Ser. No. 209,159
Int. Cl.³ H01H *73/06, 71/02*
U.S. Cl. 335—9 11 Claims

1. The combination of a plurality of circuit breaker units, each unit having its own case containing; a pair of relatively movable contacts, an automatically resettable mechanism including a pivotable contact arm movable between open and closed positions, a tripping device including an armature pivotally movable toward and away from an electromagnetic coil or the like, said mechanism including a crank arm movable between "on" and "off" positions and a collapsible link with one end pivotally connected to said crank arm and its other end to said contact arm, latch means for preventing said link from collapsing, and means for disabling said latch means when said crank arm is moved "on" and said armature has been moved toward said coil, a common trip member of U-shape, with one leg of the "U" located adjacent one inside wall of the case and having a portion engageable with the associated resettable mechanism, the other leg of the U-shaped common trip member having a portion engageable with said means for disabling said latch means; at least two mating cases having abutting side walls assembled adjacent one another and having aligned openings defining a cavity, a common trip coupler located in said cavity and having opposing portions cooperating with

portions of the U-shaped common trip members inside adjacent switch cases to cause pivotal movement of one of said





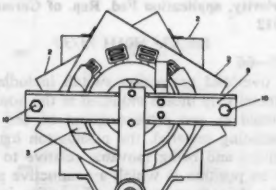
members to move said coupler and in turn to effect pivotal movement of the trip member in the adjacent case.

4,347,489

VARIABLE THREE-PHASE INDUCTOR

Bruno Bambozzi, 856 Jose Bonifacio Str., Matao, SP, Brazil

Filed Nov. 12, 1980, Ser. No. 205,965
Int. Cl.³ H01F *33/00, 21/06*
U.S. Cl. 336—10 **8 Claims**



1. A variable inductor for use with a three-phase input, comprising:

a frame formed by a plurality of like square plates which are rotated with respect to each other in a single direction about a common axis, each plate having a central hole centered on the axis to define a hollow cylindrical interior volume extending axially through the frame;

a Y network including like first, second and third coils which are each connected at one end to a common point, the Y network being shaped into a hollow, elongated and generally cylindrical structure with an axis and a circumference, in which structure the first, second and third coils extend parallel to the axis and are distributed around the circumference, the structure extending into the interior volume of the frame and being coaxial therewith;

a movable reluctor having an exterior cylindrical shape and an axis, the axis of the reluctor and the axis of the structure being coincident with each other and the reluctor being axially movable into and out of the structure without physical contact therewith; and

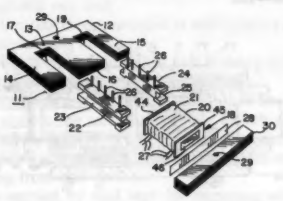
means attached to the frame and reluctor and moving the reluctor in and out of the structure when the means is operated by a user.

4,347,490

LOW PROFILE TRANSFORMER

David A. Peterson, McHenry, Ill., assignor to Prem Magnetics, Inc., McHenry, Ill.

Filed Mar. 6, 1981, Ser. No. 241,447
Int. Cl.³ H01F *15/10, 27/30*
U.S. Cl. 336—60 **10 Claims**



1. A low profile transformer comprising in combination, a magnetic core having a stem, two outer legs and a center leg, a window formed between the center leg and each of the outer legs, a bobbin assembly including coil windings thereon received by said center leg, connecting pin headers mounted onto said inner side of said outer legs in said windows, pins connecting to associated electronic circuitry mounted on said headers, and said pin headers, said coil windings and said core being of substantially the same height.

4,347,491

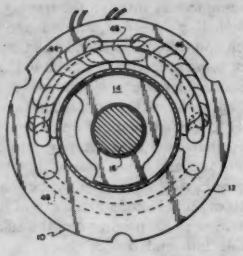
ROTARY VARIABLE DIFFERENTIAL TRANSFORMER WITH SUBSTANTIALLY LINEAR OUTPUT

Jacob Chass, Rego Park, N.Y., assignor to Pickering & Company, Inc., Plainview, N.Y.

Filed Feb. 2, 1981, Ser. No. 230,338
Int. Cl.³ H01F *21/06*
U.S. Cl. 336—135 **7 Claims**

1. A rotary variable differential transformer comprising: a stator having a circular rotor opening extending therethrough; first and second secondary coils connected to each other in series opposition extending arcuately along adjacent substantial quadrants of the periphery of said opening; a primary coil extending along substantially half the periphery of said opening; and a rotor positioned within said opening, said rotor having first and second diametrically opposed pole pieces, said

first pole piece being equal in arcuate length to one half the combined arcuate length spanned by said secondary coils and



said second pole piece being equal in arcuate length to one third the remainder of the periphery of said opening.

4,347,492

VARIABLE INDUCTANCE TRANSDUCERS

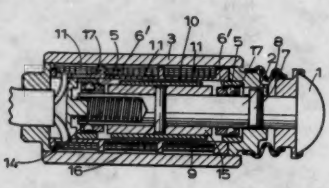
John M. Davis, Loxwood, and Barrie C. Burton, Stockton, both of England, assignors to System E Controls Ltd., Leamington Spa, England

Filed Dec. 9, 1980, Ser. No. 214,769

Claims priority, application United Kingdom, Dec. 15, 1979, 7943280

Int. Cl.³ H01F *21/06*

U.S. Cl. 336—136 **1 Claim**



1. In a variable inductance transducer comprising; a cylindrical housing; an elongate cylindrical plunger formed in one piece and mounted within said housing coaxially therewith for movement in the direction of the length of said plunger, an end portion of said plunger projecting from one end of said housing, a sensing tip on said projecting end portion, means preventing rotation of said plunger within said housing about the axis thereof; a hollow elongate cylindrical bobbin mounted rigidly within said housing coaxial with said housing and said plunger and having first and second ends, a multi-turn electrical coil wound on said bobbin; a hollow tubular magnetic core, said core being mounted on and secured to said plunger and disposed for movement, with said plunger, within said bobbin, said core being shorter than said bobbin and wholly therewithin, and first and second linear ball bearing means locating said plunger within said housing for said linear movement without lateral play, the improvement wherein said first bearing means comprises a first outer race located in said first end of said bobbin and a ring of circumferentially spaced bearing balls, said balls bearing directly on said first outer race and a portion of said plunger, and said second bearing means comprises a second outer race located in said second end of said bobbin and a second ring of circumferentially spaced bearing balls, said last-mentioned balls bearing directly on a second outer race and a further portion of said plunger axially spaced from said first portion, and said core lying axially wholly between said first and second bearing means.

4,347,493

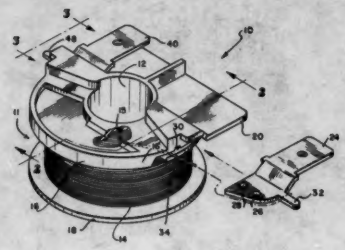
COIL ASSEMBLY

Richard E. Adams, Indianapolis, and Richard W. Stafford, Clayton, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Continuation of Ser. No. 772,585, Feb. 28, 1977, abandoned. This application Feb. 28, 1978, Ser. No. 880,522

Int. Cl.³ H01F *15/10, 27/30*

U.S. Cl. 336—192 **4 Claims**



1. A coil assembly comprising:

(a) a spindle,

(b) a terminal retaining flange extending from an end of said spindle and a second flange extending from an opposite end of said spindle,

(c) a first slot extending from an outer face of said terminal retaining flange into but not through a thickness of same and to an outer edge thereof,

(d) a second slot disposed substantially diametrically opposed from said first slot and extending from said outer face through a thickness of said terminal retaining flange to an inner face and to an outer edge thereof, at least a portion of said second slot extending to at least a near side of said spindle,

(e) electrical terminals carried in said first and second slots, and

(f) a coil of wire wound about said spindle, a start of said wire connected to a terminal and extending therefrom through said portion of said second slot extending to at least a near side of said spindle,

and an end of said wire connected to the other of said electrical terminals

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4,347,494

BIMETAL-CONTROLLED OVERLOAD PROTECTION SWITCH

Fritz Krasser, Altdorf, Fed. Rep. of Germany, assignor to Ellenberger & Poensgen GmbH, Altdorf, Fed. Rep. of Germany

Filed Oct. 13, 1981, Ser. No. 310,868

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1980, 3038512

Int. Cl.³ H01H *73/30*

U.S. Cl. 337—66 **12 Claims**

1. In an overload protection switch including a narrow housing, bimetal strip means mounted in the housing, a pushbutton mounted in, and projecting out of, the housing and made of insulating material, the pushbutton being provided with a partition and being movable relative to the housing between an on position in which a conductive path is established via the strip means and an off position in which such conductive path is broken, and spring means urging the pushbutton into its off position, the improvement wherein:

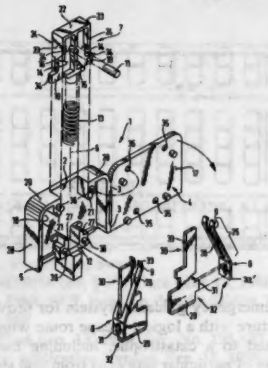
said housing, said pushbutton and said bimetal strip means are physically symmetrical to the longitudinal center axis of said housing;

the path of movement of said pushbutton is along that center axis;

said bimetal strip means comprise two identical bimetal strips disposed symmetrically relative to the center axis,

each strip having a first part fastened to said housing and a second part which is movable relative to said housing in response to temperature changes, with said second parts converging toward one another while remaining out of contact;

said pushbutton carries a conductive contact piece at a location such that in the on position of said pushbutton said



contact piece is wedged between said strips just beyond the location where said second parts are closest to one another to be held by said second parts against the force of said spring means and in the off position of said pushbutton said partition is disposed between said strips at the location where said second parts are closest to one another.

4,347,495

METHOD OF DETECTING OXYGEN AND AN OXYGEN SENSOR THEREFOR

Donald N. Hunter, Bognor Regis, and Richard J. Brook, Leeds, both of England, assignors to Rosemount Engineering Company Limited, West Sussex, England

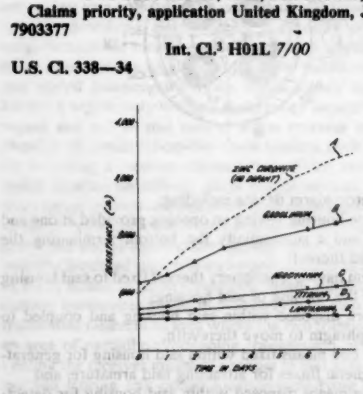
PCT No. PCT/GB80/00017, § 371 Date Sep. 30, 1980, § 102(e) Date Sep. 23, 1980, PCT Pub. No. WO80/01610, PCT Pub. Date Aug. 7, 1980

PCT Filed Jan. 31, 1980, Ser. No. 205,953

Claims priority, application United Kingdom, Jan. 31, 1979, 7903377

Int. Cl.³ H01L 7/00

U.S. Cl. 338—34 12 Claims



1. A sensing element for an oxygen detector, comprising a body of chromium-rich zinc chromite having in excess of a stoichiometric proportion of chromium in zinc chromite, and means for making electrical contact with the body of zinc chromite to sense its electrical resistance.

4,347,496

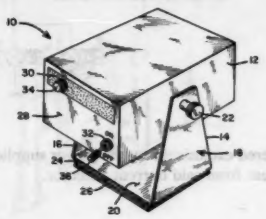
ELECTRONIC FUEL MANAGEMENT SYSTEM

Thomas P. Kubalak, 1112 - 45th Ave. NE., Minneapolis, Minn. 55421; Gene M. Berghoff, 6923 Woodland Dr., Eden Prairie, Minn. 55344, and William J. Palmer, 4800 W. 111th, Bloomington, Minn. 55437

Filed Mar. 10, 1980, Ser. No. 128,517

Int. Cl.³ B60Q 1/34; H01H 35/06

U.S. Cl. 340—52 R 2 Claims



1. Apparatus for indicating when the acceleration of a device in a selected direction exceeds a predetermined value, comprising, in combination:

(a) a housing having a longitudinal axis;

(b) switch means mounted in the housing, including an electrically conductive acceleration responsive mass movable in a direction aligned with said longitudinal axis, and a plurality of electrical contacts disposed at one end of said switch means for bridging contact by said mass when moved to said one end;

(c) a light emitting diode mounted in said housing and visible from without said housing;

(d) a disabling switch mounted in said housing and operable from without said housing;

(e) a battery removably mounted within said housing;

(f) means connecting said battery, said switch means, said diode, and said disabling switch in a series circuit;

(g) a support bracket having a base surface and support legs extending from said surface;

(h) means carried by said legs for engaging sides of said housing in adjustable supporting relation about a pivotal axis orthogonal to said longitudinal axis;

(i) Velcro loop and hook means for removably fastening said base surface to a generally flat mounting portion of the device, with said pivotal axis generally horizontal and said directions in alignment;

(j) and means fixing the adjusted position of said housing about said pivotal axis to determine the acceleration required to move said mass into bridging engagement with said contacts.

4,347,497

A.C. OPERATED SIGNALLING DEVICE FOR MOPEDS

Marc Bonnet, Valentigney, and Daniel Borde, Beaulieu-Mandeure, both of France, assignors to Cycles Peugeot, Valentigney, France

Filed Jun. 27, 1978, Ser. No. 919,517

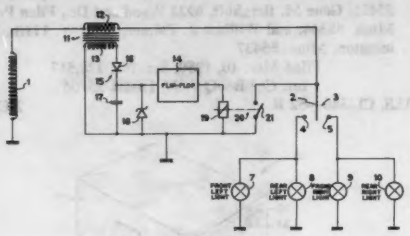
Claims priority, application France, Jun. 29, 1977, 77 19943

Int. Cl.³ B60Q 1/34; G08B 21/00

U.S. Cl. 340—73 7 Claims

1. An electric installation supplied with power by an a.c. source such as a magnetic flywheel of a Moped, comprising at least a main load, a circuit connecting the main load to said source, a monitoring system connected to monitor operation of said main load, a current detector connected in series in said circuit and capable of ensuring, as a function of the current detected, an automatic supply of power to the monitoring system by inductive coupling from said current detector to said monitoring system, said monitoring system being connected to be operatively responsive to said current detector, said moni-

toring system including means for intermittently controlling the supply of power to the main load, said monitoring system



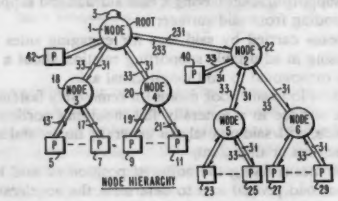
being powered exclusively by the power supplied to the monitoring system from said current detector.

4,347,498

METHOD AND MEANS FOR DEMAND ACCESSING AND BROADCAST TRANSMISSION AMONG PORTS IN A DISTRIBUTED STAR NETWORK

Robert P. Lee, Woodstock, N.Y., and Felix H. Closs, Adliswil, Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 21, 1979, Ser. No. 96,356
Int. Cl.[3] H04Q 3/60
U.S. Cl. 340—825.02 12 Claims



1. A data communications system comprising:

a transmission medium formed from an inverted three network of nodes and full duplex connecting links, the tree network having a network root node, said root node of a tree or subtree thereof having an in-degree of zero, each duplex link including an up-link and a down-link respectively defining a signal path direction toward or away from the network root node, each up and down-link being in either an idle or occupied state;

a plurality of transceiving ports attaching the network at selected nodes, ready ones of the ports transmitting messages at will;

each nodes includes:

means for ascertaining whether the state of each terminating up-link and down-link is idle or occupied; and

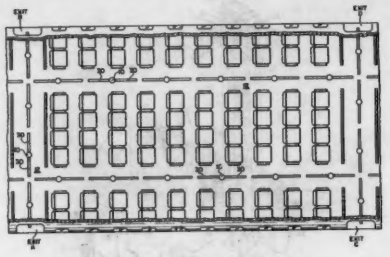
means responsive to the first occurring ascertained state transition from idle to occupied among the terminating up-links for completing an exclusive signal path connection to an outbound up-link only if the outbound up-link is concurrently idle.

4,347,499

EMERGENCY GUIDANCE SYSTEM

Thomas F. Burkman, Sr., 7525 Monroe, Niles, Ill. 60648, and Gary Cummings, Torrance, Calif., assignors to Thomas F. Burkman, Sr., Niles, Ill.

Filed Jan. 2, 1981, Ser. No. 222,002
Int. Cl.[3] G08B 7/00
U.S. Cl. 340—371 33 Claims



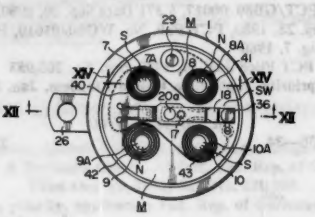
1. An emergency guidance system for providing occupants of a structure with a logical escape route when such structure is subjected to a catastrophe, including means sensing the availability of particular safe exits from said structure, discernable means arranged in display along predetermined pathways within said structure leading to available exits not affected by said catastrophe, control means responsive to said sensing means for controlling said discernable means to provide detectable pathways leading the occupants to said available safe exits.

4,347,500

ELECTRIC ALARM DEVICE

Mitsuru Ueda, Aichi, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 25, 1980, Ser. No. 181,392
Claims priority, application Japan, Sep. 7, 1979, 54-115475
Int. Cl.[3] G08B 3/00; G10K 9/00
U.S. Cl. 340—388 11 Claims



1. An electric alarm device including:

a dish-shape housing having an opening provided at one end thereof and a substantially flat bottom terminating the other end thereof;

a diaphragm having a periphery thereof fixed to said housing to close the opening of said housing;

an armature disposed within said housing and coupled to said diaphragm to move therewith;

a solenoid coil means fixed within said housing for generating magnetic fluxes for attracting said armature; and

a switching means disposed within said housing for detecting the movement of said diaphragm to conduct and break current in said solenoid coil means;

wherein:

said solenoid coil means includes: cores projecting from the bottom of said housing and having four magnetic poles arranged in a plane within said housing adjacent to said

armature, coils wound on said cores for generating magnetic fluxes linking said cores and said armature, an insulating plate through which said cores project, and at least four coils disposed in a plane on a surface of said insulating plate and spirally wound around said magnetic poles to surround said poles; and

said switching means is disposed among said four magnetic poles.

4,347,501

INSTALLATION FOR TRANSMITTING ALARM SIGNALS

Dag Akerberg, Järfälla, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

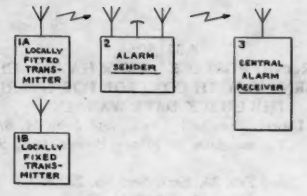
PCT No. PCT/SE79/00188, § 371 Date May 15, 1980, § 102(e) Date Apr. 18, 1980, PCT Pub. No. WO80/00630, PCT Pub. Date Apr. 3, 1980

PCT Filed Sep. 13, 1979, Ser. No. 195,637

Claims priority, application Sweden, Sep. 15, 1978, 78097425

Int. Cl.³ G08B *1/08;* H04Q *7/00*

U.S. Cl. 340—539 **3 Claims**



1. An alarm system for use in an area having a plurality of localized regions for indicating in which of the localized regions the alarm is given, said alarm system comprising: a central alarm receiver means for receiving coded alarm signals and giving area indications in accordance with received coded location-identifying alarm signals; a plurality of fixed short range transmitter means, each of said fixed transmitter means being in one of the localized regions for inductively transmitting coded location-identifying alarm signals unique to the localized region only within a short range associated with said region and not to said central alarm receiver means; and a plurality of personal portable alarm senders, each of said senders including a receiver means for receiving and storing the coded location-identifying alarm signals emitted by the fixed short range transmitter means when in close proximity thereto so that as a portable alarm sender is moved through the area it stores the coded location-identifying alarm signals associated with the localized region of its instant location to the exclusion of other coded location-identifying alarm signals, and a fixed dummy transmitter means in proximity with two of said fixed transmitter means in an area where the two transmitters having an area of partially overlapping transmission ranges for preventing the receiver means of a sender in that area from receiving and storing any coded location-identifying alarm signal other than the one already stored, and each of said senders including user-operable transmitter means for emitting stored coded-location alarm signals to said central alarm receiver means, said user-operable transmitter means having a range which is greater than the range of said short range transmitter means.

4,347,502

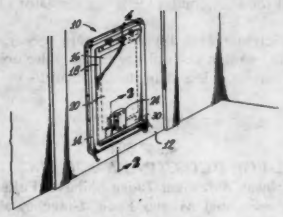
EARLY WARNING ELECTRICAL SOUND ALARM SYSTEM FOR PET DOOR STRUCTURE

David L. Holmes, Westminster, and Anne M. Hollander, Northridge, both of Calif., assignors to Johnson Pet-Dor, Inc., Valencia, Calif.

Filed May 27, 1980, Ser. No. 153,567

Int. Cl.³ G08B *13/08, 13/14*

U.S. Cl. 340—545 **16 Claims**



1. A sound alarm system for signalling unauthorized entry through a pet door when the door is covered and not in use, said system comprising in combination:

a pet door including a frame defining a passageway therethrough, and a flap swingable mounted passageway for swinging movement in either direction therethrough; cover means removably secured to one side of said frame adjacent said flap for preventing entry through said passageway; and an electrically powered sound alarm for signalling removal of said cover means said alarm including a sound signal box, and switch means having an activated state and a deactivated state, said switch means disposed between said flap and said cover means and positioned to maintain said switch means in a deactivated state when said cover means is removably secured to said frame, and further comprising second interior cover means removably secured to the opposite side of said frame adjacent said flap for preventing entry through the passageway, wherein said sound signal box includes a trip switch means which activates the sound alarm in the event said second interior cover means is removed from said frame.

4,347,503

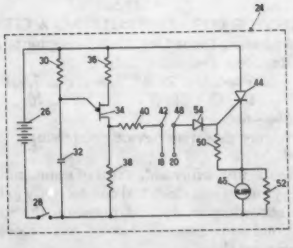
BEDWETTING DETECTION DEVICE

Otto A. Uyehara, Madison, Wis., assignor to Health Guardian Company, Monroe, Wis.

Filed Feb. 17, 1981, Ser. No. 234,825

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—604 **7 Claims**



1. A battery-operated bedwetting detector comprising a pair of conductors (12, 14) adapted to being installed in the bed of the user;

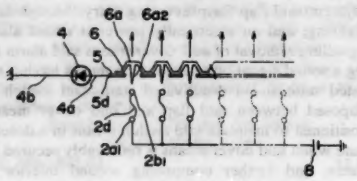
a moisture-permeable insulator (16) adapted for placement between the conductors (12, 14);
an electric current detector circuit (44, 50, 52, 54) connected to a first of the conductors (12, 14) to detect current flow therethrough;
an alarm (46) connected to the detector circuit to awaken the user when the detector circuit senses current flow;
a periodic pulse generating circuit (30, 32, 34, 36, 38, 40) connected to the second of the conductors (12, 14) to periodically generate an electrical pulse on the second of the conductors (12, 14) so as to cause current to flow through the first conductor if the insulator (16) is damp; and
a voltage divider (36, 38) in the pulse generating circuit connected so that the voltage of the pulse created by the pulsing circuit is less than the electrolysis voltage of water.

4,347,504

DEVICE FOR DETECTING A BURNT-OUT FUSE

Satoru Murofushi, Shizuoka; Tadao Shibuya, Fujieda; Shinichi Kato, Fujisawa, and Mitsuo Endo, Gotenba, all of Japan, assignors to Nissan Motor Co., Ltd., Kanagawa and Yazaki Corporation, Tokyo, both of, Japan

Filed Aug. 21, 1980, Ser. No. 179,999
Claims priority, application Japan, Aug. 24, 1979, 54-115900[U]
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—638 **5 Claims**



1. A device for detecting a burnt fuse in a fuse box accommodating a plurality of parallelly arranged blade-type fuses each having an input end and an output end, said device comprising:
an insulative support body mounted on the fuse box;
resilient contact means supported by said support body in a facing relation to the output end of the blade-type fuses;
a light-emitting element connected between said resilient contact means and ground; and
a grounding element electrically connected between said resilient contact means and said light-emitting element, said grounding element and said resilient contact means being in contact with each other in overlapped fashion, over substantially the whole area thereof.

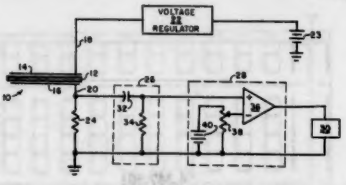
4,347,505

DEVICE FOR CONTROLLING A CIRCUIT

Gary B. Anderson, Tahoe City, Calif., assignor to Antroy Enterprises, Inc., San Francisco, Calif.

Filed Jan. 29, 1979, Ser. No. 7,411
Int. Cl.³ G01G *23/20*; H01C *10/10*
U.S. Cl. 340—666 **8 Claims**

1. A pressure detecting device comprising
a circuit,
a thin resiliently deformable sheet of semiconductor material having an internal electrical conductivity generally invariable according to applied pressure, the surface of said semiconductor material having microscopic ridges and depressions therein,
a first electrode connected to said circuit comprising a flexible sheet of electrically conductive metal foil, selected from the group consisting of copper, steel and aluminum and alloys thereof, in mechanical contact with one side of said resiliently deformable sheet material and electrically connected to said circuit,
a second electrode connected to said circuit comprising a flexible sheet of electrically conductive metal foil, selected from the group consisting of copper, steel and aluminum and alloys thereof, in mechanical contact with the other



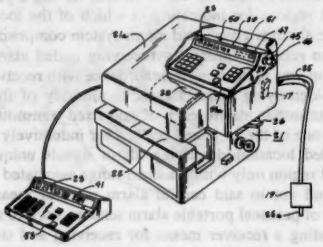
side of said resiliently deformable semiconductor sheet material and electrically connected to said circuit, and
said circuit being responsive to deforming of said microscopic ridges and depressions in the presence of applied pressure on said first electrode, resiliently deformable semiconductor sheet and second electrode combination for providing an output signal that is a function of said applied pressure.

4,347,506

ELECTRONIC POSTAGE METER HAVING CHECK DATE WARNING WITH CONTROL FOR OVERRIDING THE CHECK DATE WARNING

Edward C. Duwel, Trumbull, Conn., and John H. Soderberg, Monroe, N.Y., assignors to Pitney Bowes, Inc., Stamford, Conn.

Filed Feb. 24, 1981, Ser. No. 237,807
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—679 **12 Claims**



1. In an electronic postal meter having a postage printing device and a computer means and further including date setting means and an access door enabling external access to date setting means; the improvement comprising switch means connected to said door for signaling the position thereof to said computer means, a warning indicator coupled to said computer means for indicating that said door is opened, said computer means having an operating power input and means responsive to application of power to said meter for inhibiting operation of said meter until said access door has been opened and closed at least once and means coupled to said computer means for enabling operation of said meter when said door is closed and operable such that said meter can be enabled for operation without opening and closing said door.

4,347,507

VISUAL DISPLAY APPARATUS

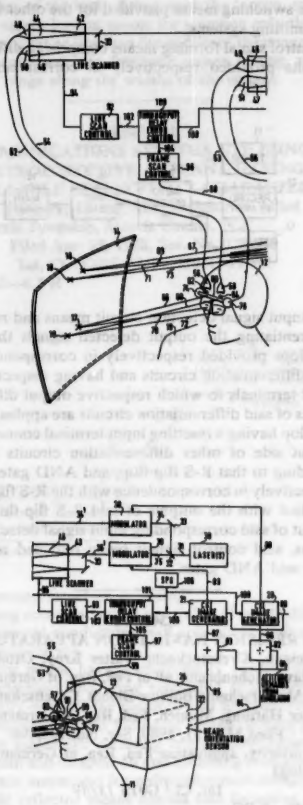
Archer M. Spooner, Orlando, Fla., assignor to Redifon Simulation Limited, Sussex, England

Filed Dec. 21, 1979, Ser. No. 105,875

Claims priority, application United Kingdom, Dec. 21, 1978, 49521/78

Int. Cl.³ G09G 3/00

U.S. Cl. 340—705 6 Claims



1. Head-coupled, area-of-interest, visual display apparatus providing pseudo-collimated viewing for more than one viewer, comprising a part-spherical retro-reflective screen of area greater than a viewer's field of view and, for each viewer, a helmet, sensing means for sensing the orientation of the respective viewer's head and helmet, visual image generating means for generating an image representing a simulated view in the direction of the respective viewer's instantaneous line of view according to a common simulated vehicle position and heading and under control of the respective sensing means, a laser light source for producing a laser beam, a laser beam modulator for modulating said laser beam, optical means for providing identical left eye and right eye views, separate line scanners for each said view for scanning the modulated laser beam over the input ends of respective fibre optic light guides, the said fibre optic light guides having their output ends at spaced-apart positions on the respective viewer's helmet, and frame scanning means mounted on the said helmet for receiving light from the light guide outputs and projecting the light as a scanned image upon the said screen.

4,347,508

VISUAL DISPLAY APPARATUS

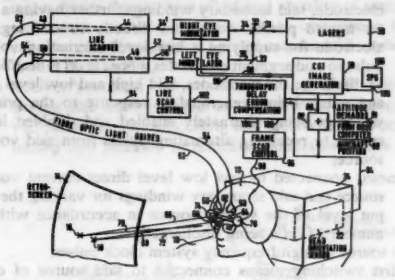
Archer M. Spooner, Orlando, Fla., assignor to Redifon Simulation Limited, England

Filed Dec. 21, 1979, Ser. No. 105,877

Claims priority, application United Kingdom, Dec. 21, 1978, 49522/78

Int. Cl.³ G09G 3/00

U.S. Cl. 340—705 5 Claims



1. Head-coupled, area-of-interest, visual display apparatus providing three-dimensional viewing for one viewer, comprising a part-spherical retro-reflective screen of area greater than a viewer's instantaneous field of view, a helmet, sensing means for sensing the orientation of the viewer's head and helmet, visual image generating means (CGI) for generating an image representing a simulated view in the direction of the viewer's instantaneous line of view according to the viewer's simulated position and heading and under control of the said sensing means, the said image generating means being adapted for providing two visual images corresponding respectively to the viewer's left eye and right eye views, a laser light source for supplying a laser beam which is split to pass through separate laser beam modulators for the left eye and right eye views, separate line scanners for each said view for scanning the modulated laser beam over the input ends of respective fibre optic light guides, the said fibre optic light guides having their output ends at spaced-apart positions on the viewer's helmet, and frame scanning means mounted on the said helmet for receiving light from the light guide outputs and projecting the light as a scanned image upon the said screen.

4,347,509

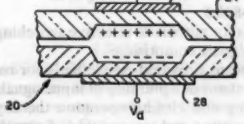
PLASMA DISPLAY WITH DIRECT TRANSFORMER DRIVE APPARATUS

Jay B. Hardway, and Larry W. Eichman, both of Cambridge, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Feb. 27, 1980, Ser. No. 125,070

Int. Cl.³ G09G 3/28

U.S. Cl. 340—778 11 Claims



1. Apparatus for driving a gas-discharge device of the type having an array of cells in which each cell has a column electrode and a segment electrode comprising in combination:

a plurality of column conductors each connected to one of said column electrodes;

a plurality of segment conductors each connected to one of said segment electrodes forming a matrix with said plurality of column conductors;

a low level direct current voltage source;

a single multi-tap secondary, high voltage autotransformer having primary windings coupled to said voltage source and center tapped secondary windings having one end connected directly to said column electrodes for supplying a high level alternating voltage pulse to said column electrodes which level is insufficient to discharge the electrode, said secondary windings further having a center tapped portion connected directly to said segment electrode for supplying a low level alternating voltage pulse to said segment electrodes whose level is insufficient to discharge the electrodes, said high and low level voltage pulses being generated in response to the primary windings being alternately enabled and disabled in response to receiving alternating pulses from said voltage source;

means connected to said low level direct current voltage source and said secondary windings for varying the output level of the voltage source in accordance with the number of cells being discharged;

a source of high frequency system clock pulses;

first switching means connected to said source of clock pulses, said low voltage direct current voltage source and said primary windings for outputting a plurality of alternating voltage pulses to said primary windings in response to receiving said clock pulses;

a plurality of second switching means each connected to one of said column conductors and to ground, each of said second switching means adapted to ground its associated column conductor to remove the high level alternating voltage pulses from its associated column electrodes when enabled;

a plurality of third switching means connected to said segment conductors and said source of clock pulses, said third switching means operated by the clock pulses for supplying said low voltage alternating pulses to said segment conductors which is out of phase with the supply of said high level alternating voltage pulses supplied to said column conductors by the secondary windings of the autotransformer;

and control means connected to said column and segment conductors and said source of clock pulses for generating control signals over said conductors to enable selected column and segment electrodes to be discharged in response to receiving said high and low level alternating voltage pulses respectively.

4,347,510

APPARATUS FOR AUTOMATIC SELECTIVE SWITCHING AND TRANSMISSION OF INPUT SIGNALS

Yukinobu Ishigaki, Machida, and Hideaki Ozaki, Sagamihara, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 26, 1980, Ser. No. 134,223

Claims priority, application Japan, Mar. 29, 1979, 54-36233; May 18, 1979, 54-61330; May 28, 1979, 54-65863

Int. Cl.³ H04Q *3/00*

U.S. Cl. 340—825.5 **3 Claims**

1. Apparatus for automatic selective switching and transmitting of input signals comprising:

switching means provided respectively for respective transmitting systems of a plurality of input signals and undergoing opening and closing operation thereby to carry out non-transmitting and transmitting of signals;

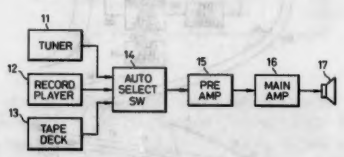
input signal detection circuit means supplied with said input signals and detecting same to produce detected signals; and

means for forming control signals supplied with said detected signals and forming control signals for closing the switching means provided for the transmitting system of an input signal which has arrived and causing the switching means of the other transmitting systems to open or to remain opened,

said switching means being a plurality of normally-open switch means which close when said control signals are applied thereto,

said control signal forming means generating a control signal which causes closure of the switching means provided for the transmitting system of an input signal which has arrived and does not generate a control signal with respect to the switching means provided for the other input signal transmitting systems,

said control signal forming means comprising differentiation circuits provided respectively in correspondence with



said input signal detection circuit means and respectively differentiating the output detected signals thereof, R-S flip-flops provided respectively in correspondence with said differentiation circuits and having respective setting input terminals to which respective output differentiated pulses of said differentiation circuits are applied, each R-S flip-flop having a resetting input terminal connected to the output side of other differentiation circuits not corresponding to that R-S flip-flop, and AND gates provided respectively in correspondence with the R-S flip-flops and supplied with the outputs of said R-S flip-flops and the output of said corresponding input signal detection circuit means, said control signals being obtained respectively from said AND gates.

4,347,511

PRECISION NAVIGATION APPARATUS

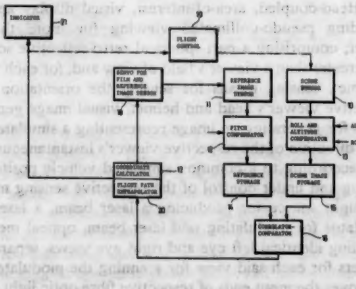
Otto Hofmann, Kirchstockach; Walter Kroy, Ottobrunn, and Peter Nave, Hohenbrunn, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Fed. Rep. of Germany

Filed Mar. 31, 1980, Ser. No. 135,898

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1979, 2914693

Int. Cl.³ G01S *13/89*

U.S. Cl. 343—5 PC **12 Claims**



1. A device for image-correlation precision navigation of bodies flying over terrain comprising: a plurality of reference images of the terrain to be flown over, said images each having a given width, a scene sensor for scanning the terrain flown over and producing values corresponding to the scenes

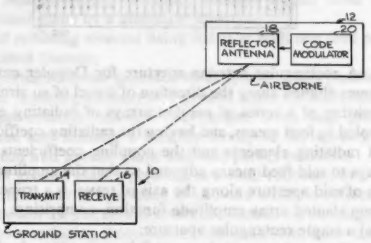
scanned, a reference image sensor for continuously and simultaneously scanning the reference images corresponding to the terrain scanned by the scene sensor and producing values corresponding to the reference images, comparator means for comparing the values of the scanned reference images and scene with each other, feedback means responsive to said comparator for shifting the scanning of said reference image sensor along a course over said reference images based on the comparison of said comparator means so that the course corresponds to that of the body flying over the terrain, said reference image sensor having means for scanning only the area of said film over a range less than the widths of the images around the map course and said feedback means having means for shifting the range along the widths of the images.

4,347,512

COMMUNICATIONS SYSTEMS UTILIZING A RETRODIRECTIVE ANTENNA HAVING CONTROLLABLE REFLECTIVITY CHARACTERISTICS

Edmund F. Sweeney, Laurel, Md., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Apr. 18, 1968, Ser. No. 723,348
Int. Cl.³ G01S *13/74*; H01Q *19/08*
U.S. Cl. 343—6.5 R **5 Claims**



1. An antenna structure including:

a focussing means including a plurality of substantially parallel electrical conductors each coincident with a common spherical surface,

a reflector means having controllably variable reflectivity characteristics and being supported at the locus of substantially one-half the radius of said spherical surface, and

means supporting said focussing means relative to said reflector means for directing energy-propagating along a first path and incident on said focussing means against said reflector means and for redirecting such energy reflected by said reflector means against said focussing means for redirection along said first path.

4,347,513

NETTED SEARCH RADAR SYSTEM

John K. Schindler, Chelmsford, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 47,527, Jun. 8, 1979, abandoned. This application Sep. 9, 1980, Ser. No. 185,469
Int. Cl.³ G01S *7/38, 13/74, 13/48*
U.S. Cl. 343—18 E **8 Claims**

1. A netted search radar system to defeat monopulse anti-radiation missiles comprising in combination:

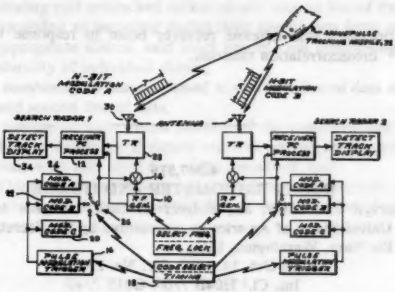
a plurality of search radar units at fixed locations operating simultaneously and scanning asynchronously, each of said plurality of search radar units comprises in combination:

an R.F. generator to provide an R.F. carrier frequency, said R.F. generator including a mixer to receive a modulation source, each of said plurality of search radar units operating at substantially the same R.F. carrier frequency,

a modulation means connected to said mixer in order to modulate said R.F. carrier frequency thereby providing a modulated signal, said modulation means utilizing one of a plurality of selectable modulation codes which is different from that of all other search radar units,

a T/R switch receiving said modulated signal from said mixer, said T/R switch applying said modulated signal to an antenna for transmission, said modulated signal being radiated to a target in a surveillance region to produce a reflected target return signal, the reflected target return signals from all of said plurality of search radar units are combined in space to comprise a received signal for reception by said antenna and applied to said T/R switch,

a receiver/processor unit connected to said T/R switch having said received signal applied thereto, said receiver/processor unit processing said received signal containing said plurality of returned modulation codes to



selectively detect the modulation code that was transmitted by its own search radar unit, said receiver/-processor unit providing target data, and;

a radar control unit electronically linked with each of said plurality of search radar units, said radar control unit controls the selection of the R.F. carrier frequency within each R.F. generator of said plurality of search radar units, said radar control unit periodically locking said R.F. carrier frequency to an external source within radar control unit to maintain R.F. carrier frequency stability, said radar control unit selecting a different modulation code for each of said plurality of search radar units, said radar control unit providing timing signals to each of said plurality of search radar units which synchronizes the triggering of said modulation means and provides for a specific delay of each modulated signal to insure an overlap in signal transmission in the surveillance region.

4,347,514

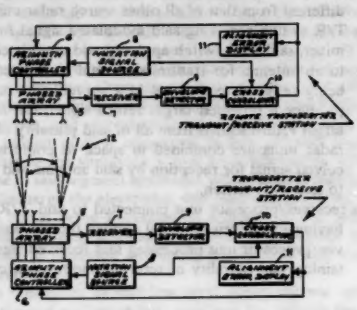
TROPOSCATTER SYSTEM ANTENNA ALIGNMENT

William P. Birkemeier, Madison, Wis., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 19, 1980, Ser. No. 179,597
Int. Cl.³ G01S *1/44*
U.S. Cl. 343—100 CS **8 Claims**

8. An antenna aligment method comprising the steps of nutating the antenna receive beam with a sinusoidal nutating signal to provide a received signal having a modulated envelope,

crosscorrelating said nutating signal within the modulated envelope of said received signal, and



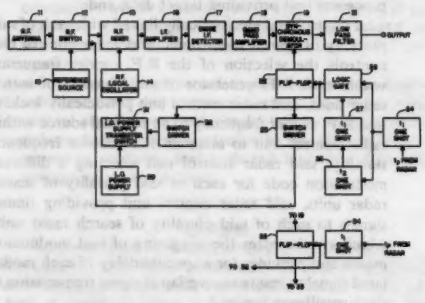
orienting said antenna receiver beam in response to the crosscorrelation function.

4,347,515

RADAR RADIOMETER AND ITS USE

Mervyn C. Hoover, Jr., Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 14, 1980, Ser. No. 196,225
Int. Cl.[3] H04B 7/00; G01S 7/40
U.S. Cl. 343—100 ME 18 Claims



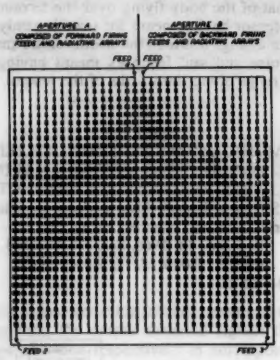
1. A radar-radiometer comprising:
an antenna;
a reference signal source;
an antenna switch having a first input connected to said antenna and another input connected to said reference signal source and an output;
a mixer circuit connected to said output of said antenna switch;
a local oscillator connected to said mixer;
a power supply;
a power switch connected to said local oscillator and to said power supply for selective interruption of the flow of electrical power therebetween; and
logic circuit means for actuating said antenna switch and said power switch and operatively connected thereto, whereby the signals from said antenna and said local oscillator are interrupted to effect a high degree of signal attenuation for high power level RF sources.

4,347,516

RECTANGULAR BEAM SHAPING ANTENNA EMPLOYING MICROSTRIP RADIATORS

Abraham Shrekenhamer, Wharton, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Jul. 9, 1980, Ser. No. 167,285
Int. Cl.[3] H01Q 1/28, 3/24
U.S. Cl. 343—700 MS 8 Claims



1. A rectangular antenna aperture for Doppler navigation systems aligned along the direction of travel of an aircraft and consisting of a series of parallel arrays of radiating elements coupled to feed means, and having the radiating coefficients of said radiating elements and the coupling coefficients of said arrays to said feed means adjusted so that the amplitude function of said aperture along the axis of travel is a truncation of a long slanted array amplitude function, comprising:

(a) a single rectangular aperture;

(b) first and second forward-firing traveling feed arrays disposed along one end of said aperture;

(c) first and second backward-firing traveling wave feed arrays arranged along the opposite end of said aperture, each of said traveling wave feed arrays having two input ports;

(d) a first set of forward-firing traveling wave radiating arrays extending between said feed arrays in spaced relationship with each other, each of said first set of forward-firing traveling wave radiating arrays having one end coupled to said first forward-firing traveling wave feed array and another end coupled to said first backward-firing traveling wave feed array;

(e) a first set of backward-firing traveling wave radiating arrays disposed in the spaces between said first set of forward-firing traveling wave radiating arrays such that said first set of forward and said first set of backward arrays alternate with each other, each of said backward-firing traveling wave radiating arrays having their one end coupled to said first forward-firing traveling wave feed array and their other end coupled to said first backward-firing traveling wave feed array;

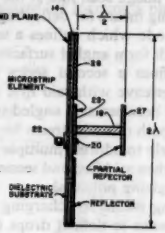
(f) a second set of forward-firing traveling wave radiating arrays, one such array being disposed adjacent each of said first set of forward-firing traveling wave radiating arrays;

(g) a second set of backward-firing traveling wave radiating arrays one being disposed next to each of said first set of backward-firing traveling wave radiating arrays, each of the arrays of the said second sets of forward and backward-firing traveling wave radiating arrays having one end coupled to said second forward-firing traveling wave feed array and their other end coupled to said second backward firing traveling wave feed array, whereby with a single aperture eight separate beams can be generated.

4,347,517
MICROSTRIP BACKFIRE ANTENNA

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 26, 1981, Ser. No. 228,429
Int. Cl.³ H01Q *1/38, 19/12*
U.S. Cl. 343—700 MS 22 Claims

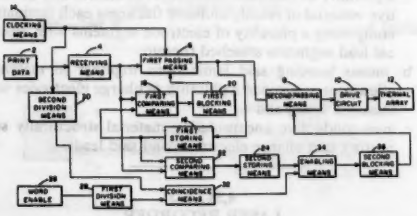


1. A microstrip backfire antenna comprising:
a. a thin ground plane conductor;
b. a thin microstrip radiating element spaced from said ground plane by a dielectric substrate;
c. said radiating element being fed at at least one feed point located thereon;
d. a partial reflector mounted directly above and parallel to said radiating element and ground plane at a distance of approximately one-half wavelength from said ground plane and forming a backfire cavity in the spacing between said ground plane and said partial reflector;
e. said ground plane operating as a total reflector, and said backfire cavity operating to provide multiple reflections between the partial and total reflectors of electromagnetic waves radiating from said radiating element with energy being radiated normal to and through said partial reflector.

4,347,518
THERMAL ARRAY PROTECTION APPARATUS

Glenn L. Williams, Bay Village, and Edward J. Reilly, Mayfield Heights, both of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 72,544, Sep. 4, 1979, Pat. No. 4,271,414. This application May 29, 1981, Ser. No. 268,434
Int. Cl.³ G01D *15/10*
U.S. Cl. 346—1.1 7 Claims



7. A method of thermal array protection for use in thermal imaging apparatuses of the type having a linear array of heat generating resistive elements used to place marks on thermal sensitive recording media during printing operations, said method comprising the steps of:
(a) receiving an incoming digital first line of data from an appropriate source, said first line of data comprising a plurality of individual datum;
(b) passing said digital first line of data to a driving means for current driving thermal array stylii;
(c) clocking the passing first line of data to position and synchronize the individual datum within said first line of data to the individual stylus to be driven;
(d) storing said first line of data;
(e) receiving an incoming digital second line of data from said appropriate source, said second line of data comprising a plurality of individual datum;
(f) blocking the passing to said driving means of the individual datum within said second line of data for those positions in which data exists in corresponding positions of the stored first line of data;
(g) passing the datum not blocked from said second line of data to said driving means;
(h) clocking the passing of the unblocked datum of said second line of data to position and synchronize said unblocked datum of said second line of data to the individual stylus to be driven;
(i) storing said unblocked datum of said second line of data;
(j) receiving an incoming digital third line of data from said appropriate source, said third line of data comprising a plurality of individual datum;
(k) combining the datum passed in said first line of data and said second line of data;
(l) comparing each datum position of the combined line of data to determine if datum exists in corresponding positions with said third line of data received; and
(m) blocking the passing to said driving means of the individual datum within said third line of data for those datum positions in wh

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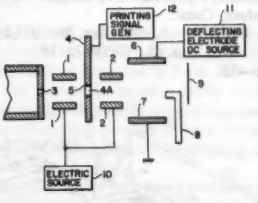
4,347,519
INK JET PRINTER

Masatsugu Kikuchi, and Masayoshi Tamai, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Aug. 11, 1980, Ser. No. 177,045
Claims priority, application Japan, Aug. 23, 1979, 54-106655
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 3 Claims

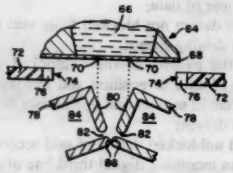


1. An ink jet printer comprising: a plurality of nozzles for producing ink jets which separate into ink particles; charging electrodes disposed substantially at ink jet separating positions for controlling the charging of said ink particles according to a printing signal; deflecting electrodes for deflecting charged ink drops toward a gutter; at least one set of auxiliary charging electrodes disposed adjacent said charging electrodes for charging ink particles separated at positions shifted from the positions of said charging electrodes; and means for continuously applying a predetermined voltage to said auxiliary charging electrodes.

4,347,520
INK JET PRINTER

Suresh C. Paranjpe, Dallas; James W. Davis, Richardson, both of Tex.; Robert J. Scranton, and Roger D. Wells, both of Dayton, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Division of Ser. No. 75,055, Sep. 12, 1979. This application Sep. 23, 1980, Ser. No. 189,872
The portion of the term of this patent subsequent to Dec. 9, 1997, has been disclaimed.
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 8 Claims



1. An ink jet printer for depositing ink drops on a print receiving medium, comprising:

print head means for generating a plurality of jet drop streams, said streams being arranged in at least one row,

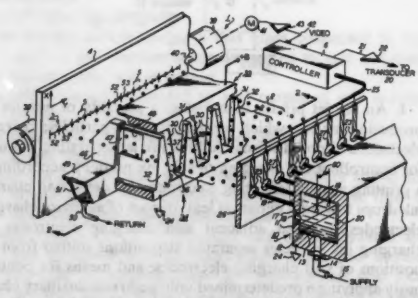
a pair of drop catchers, each catcher defining a drop impingement surface, said pair of catchers being pivotable into drop catching positions with said drop impingement surfaces being substantially parallel and positioned on opposite sides of said row of jet drop streams for catching drops deflected thereto by an electrostatic deflection field, and said pair of catchers being pivotable into full catch positions in which said drop impingement surfaces are inclined with respect to said row of jet drop streams and said catchers intercept all of the drops in said jet drop streams, and

means for pivoting said pair of drop catchers between said drop catching positions and said full catch positions, whereby drops are caught continuously by said catchers before and after printing with said catchers in said full catch positions, thus increasing the reliability of start up and shut down.

4,347,521
TILTED DEFLECTION ELECTRODE METHOD AND APPARATUS FOR LIQUID DROP PRINTING SYSTEMS

Roger G. Teumer, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 3, 1980, Ser. No. 203,210
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 13 Claims



1. Liquid drop apparatus for printing with drops on a target in alignment with the pixels of a linear scan line of a raster image comprising:

drop generating means for generating a plurality of drop streams in flight toward a target moving with respect to said generating means including a linear array of nozzles for emitting liquid under pressure to create liquid columns from which the drops are formed, the nozzle spacing within the array being a distance enabling drops from a single nozzle to address multiple pixels within a segment of a raster image scan line at the target,

drop deflecting means for deflecting charged drops having a first electrode which defines a series of teeth-like extensions which form angled surfaces and a second electrode which defines a second series of teeth-like extensions which interleave with said first set to create an electrostatic field between said angled surfaces which intercepts the flight path of each stream for deflecting drops from a single nozzle to address multiple pixels within a scan line segment when said first and second electrodes are coupled to an energizing potential,

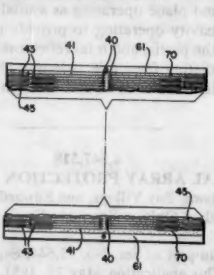
drop charging means for charging drops to enable the deflecting means to deflect drops to the multiple pixel addresses within a segment of a scan line at a target, and

controller means for coupling charging voltages to the drop charging means in a sequence compatible with the angle of the electrode surfaces for creation of a linear row of drops in alignment with a scan line of a raster pattern.

4,347,522
LAMINATED METAL CHARGE PLATE

Surinder K. Bahl, and Walter L. Schutrum, both of Dayton, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Apr. 1, 1981, Ser. No. 249,769
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 14 Claims



1. A charge plate for a jet drop printer, comprising:

a. a plurality of matched laminations of electrically conductive material of readily etchable thickness each lamination comprising a plurality of electrode segments with electrical lead segments attached thereto;

b. means bonding said laminations together in matching alignment to provide a plurality of charge electrodes with attached leads; and

c. non-conductive encapsulating material structurally supporting said charge electrodes and said leads.

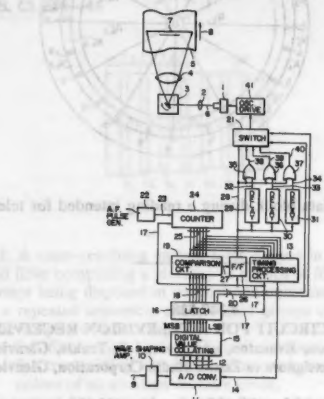
4,347,523
LASER RECORDER

Yuji Ohara, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 22, 1981, Ser. No. 256,468
Claims priority, application Japan, Apr. 24, 1980, 55/54608
Int. Cl.³ G01D *15/14*
U.S. Cl. 346—108 10 Claims

1. A laser recorder comprising: means for sampling an input signal with a sampling signal; means for producing a high frequency pulse signal having a frequency higher than the

frequency of said sampling signal; means for outputting a number of high frequency pulses from said high frequency pulse signal in a predetermined sampling period according to a level of said input signal; means for producing a fundamental pulse width modulation signal having a pulse width corresponding to said number of high frequency pulses; means for delaying said fundamental pulse width modulation signal to provide a plurality of delayed pulse width modulation signals of different delay times, means for forming a plurality of composite pulse width modulation signals as logic operations of said fundamental pulse width modulation signal and at least two of said plurality of delayed pulse width modulation signals; means for selecting one of said fundamental pulse width modulation signal and composite pulse width modulation signals for every sampling period; and means for binary modulating a laser light beam in response to the selected one of said fundamental pulse width modulation signal and said composite pulse width modulation signals.

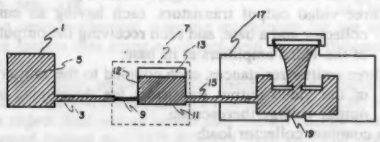


4,347,524

APPARATUS FOR ABSORBING SHOCKS TO THE INK SUPPLY OF AN INK JET PRINTER

Pedro F. Engel, Fort Collins, and Phillip A. McCollum, Loveland, both of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 7, 1980, Ser. No. 175,991
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R **4 Claims**



1. Apparatus for absorbing physical shock pulses travelling through the ink within an ink supply tube connecting an ink supply cartridge and a print head of an ink jet printer, the apparatus comprising:

restriction means positioned along the ink supply tube for restricting the flow of the ink through the ink supply tube; and

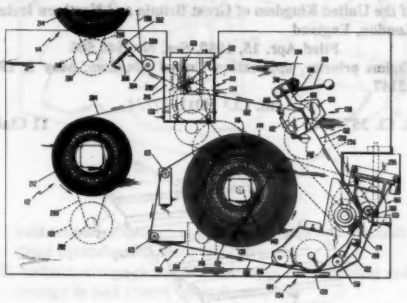
reservoir means having an input for receiving ink from the restriction means and having an output connected to the print head.

4,347,525

ELECTROSTATIC LABEL PRINTING SYSTEM

Robert A. Moore, Amherst; Bruce K. Norlund, Keene; Harold S. Kontrovitz, Keene; Clayton B. Robbins, Keene, and Jeffrey B. Brooks, Keene, all of N.H., assignors to Markem Corporation, Keene, N.H.

Division of Ser. No. 87,153, Oct. 22, 1979, Pat. No. 4,281,334.
This application Sep. 25, 1980, Ser. No. 190,804
The portion of the term of this patent subsequent to Jul. 28, 1998, has been disclaimed.
Int. Cl.³ G01D *15/06*; G03G *15/22*
U.S. Cl. 346—153.1 **4 Claims**



1. An electrostatic label printing system for printing label indicia on a continuous strip of label stock comprising an adhesive-backed layer capable of receiving a latent charge image and a releasable backing layer on the adhesive surface thereof, said electrostatic label printing system comprising:

(a) a supply reel for dispensing a continuous strip of said label stock,

(b) an electrostatic write station for carrying out latent imaging at discrete locations on the adhesive-backed layer of said continuous strip of label stock to form successive latent images thereon,

(c) a developing station for rendering visible the latent image produced on said continuous strip of label stock by the electrostatic write station,

(d) a pressure fixing station for rendering permanent the visible images developed on said continuous strip of label stock by said developing station, said pressure fixing station comprising first and second pressure rollers for grippingly engaging said continuous strip of label stock therebetween,

(e) a rotary die cutting station for die cutting only the adhesive-backed layer of said continuous strip of label stock around said discrete locations to form individual printed labels on the releasable backing layer, said rotary die cutting station including a rotating cutting member having at least one die cutting element thereon having a tangential velocity for making periodic penetrating contact with said adhesive-backed layer,

(f) drive means for supplying rotary power to said rotary cutting member and to at least one of said first and second pressure rollers for drawing the continuous strip of label stock grippingly engaged therebetween through said electrostatic write station and said developing station at a uniform feed velocity equal to the tangential velocity of said cutting element,

(g) label takeup means for drawing said continuous strip of label stock through said rotary cutting station at said uniform feed velocity and for rewinding said releasable backing layer with said individual printed labels thereon onto a label takeup reel,

(h) waste takeup means for drawing said continuous strip of label stock through said rotary cutting station at said uniform feed velocity and for rewinding onto a waste

takeup reel the strip of waste cuttings cut from the adhesive-backed layer by the die cutting operation, and

(i) means for defining said discrete locations on the adhesive-backed layer of said continuous strip of label stock at said electrostatic write station.

4,347,526

RADIATION DETECTORS

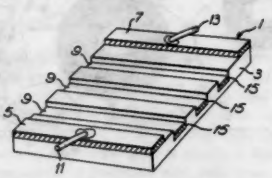
Charles T. Elliott, Malvern, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Apr. 15, 1980, Ser. No. 140,506

Claims priority, application United Kingdom, May 1, 1979, 7915147

Int. Cl.³ H01L 27/14

U.S. Cl. 357—30 **11 Claims**



6. A radiation detector comprising: a substrate of cadmium mercury telluride photoconductive material responsive to infra-red radiation of wavelength lying in the 3 to 5 μm or 8 to 14 μm bands of the infra-red spectrum; a photosensitive element formed of the substrate material between an input contact to the substrate and an output contact to the substrate; there being defined a photocarrier flow-path between the input and output contacts; and a plurality of spaced separate regions of conductive material, each in ohmic contact with the substrate material, disposed in the photo-carrier flow-path for providing means for recombining a substantial proportion of photocarriers generated in the substrate material, the spacing between the input contact and a first one of the regions of conductive material, between adjacent regions of the conductive material, and between a last one of the regions of conductive material and the output contact, being substantially less than the spacing between the input contact and the output contact, and such as to extend the bandwidth response of the element.

4,347,527

VIDEO RECORDING ON DISK AND DEVICE FOR THE REPETITIVE READING OF SUCH A RECORDING

Lucien Lainez, Paris, France, assignor to Thomson-Brandt, Paris, France

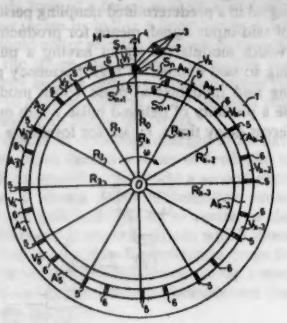
Filed Aug. 14, 1980, Ser. No. 178,127

Claims priority, application France, Aug. 17, 1979, 79 20887

Int. Cl.³ A04N 5/76

U.S. Cl. 358—4 **12 Claims**

1. A system for audio-visual recording on a disk of video signals arranged along a track comprising a system of turns, audio signals being associated with the video signals so as to transcribe the sound accompaniment of each of the achromatic or polychromatic pictures stores on the disk, characterized in that in at least one annular reading region of this disk each turn is subdivided into equal sectors each having at least two successive zones in which are respectively provided a block of video data and a block of audio data, the quantity of data contained in each audio data block being adequate to permit the reproduction of a sound accompaniment portion whose duration in real time substantially exceeds the processing time



of this audio data block during a reading intended for television.

4,347,528

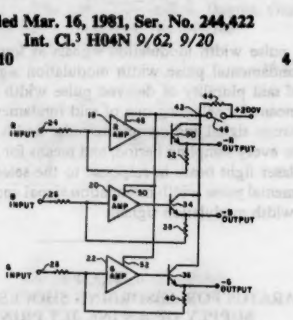
G2 SET-UP CIRCUIT FOR A TELEVISION RECEIVER

Fred D. Johnson, Evanston, and George J. Tzakis, Glenview, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Mar. 16, 1981, Ser. No. 244,422

Int. Cl.³ H04N 9/62, 9/20

U.S. Cl. 358—10 **4 Claims**



1. In a television receiver whose CRT includes three cathodes and a G2 electrode, and which has three video output amplifiers for driving the cathodes, a set-up circuit for establishing three similar video output voltages for use in properly setting the G2 electrode voltage, comprising:

three video output transistors, each having an emitter, a collector and a base, and each receiving the output of one of the video amplifiers at its base;

three emitter resistances, each coupled to the emitter of one of the video output transistors for developing a video output voltage thereacross;

a common collector load;

means for coupling the collector load between a supply voltage and the collectors of the three output transistors; and

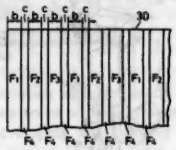
means for shunting the load during normal receiver operation to apply the supply voltage to the collectors of the output transistors, and for removing the shunt from the common load during G2 set-up so that the load is coupled in series with the collectors of all the output transistors for dropping a selected voltage thereacross and establishing a common, selected output voltage at the emitters of the video output transistors.

4,347,529

COLOR-RESOLVING STRIPED FILTER FOR CAMERA TUBE

Itsuo Takanashi; Shintaro Nakagaki; Tadayoshi Miyoshi, all of Yokohama; Koichiro Motoyama, Ninomiya-Machi; Kenichi Miyazaki, Sagamihara, and Sumio Yokokawa, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Apr. 4, 1980, Ser. No. 137,417
Claims priority, application Japan, Apr. 4, 1979, 54-40471
Int. Cl.³ H04N 9/07
U.S. Cl. 358—44 5 Claims



1. A color-resolving striped filter for use in a camera tube, said filter comprising a plurality of groups of filter stripes, said groups being disposed in parallel and consecutively arranged in a repeated sequence, each of said groups consisting of six filter stripes, which comprise:

a first filter stripe having a light transmission characteristic for transmitting the light of one of the three primary colors of an addition mixture color,

a second filter stripe having a light transmission characteristic for transmitting the light of a mixed color which includes the primary color transmitted through said first filter stripe and one of the other two primary colors,

a transparent third filter stripe for transmitting white light, and

three filter stripes of a fourth light transmitting characteristic, each of said fourth characteristic stripes being disposed between and adjacent to the first, second, and third filter stripes,

each of the first, second, and third filter stripes having a first and uniform width and each of the stripes with a fourth characteristic having a second and uniform width which is less than said first width,

said six filter stripes of each group being arranged in parallel and consecutively in a specific sequence.

4,347,530

SCANNING MIRROR ARRANGEMENT

Norman B. Stetson, Lexington, Mass., assignor to Inframetrics, Inc., Boston, Mass.

Filed Oct. 24, 1980, Ser. No. 200,571
Int. Cl.³ H04N 7/18, 3/08
U.S. Cl. 358—113 22 Claims

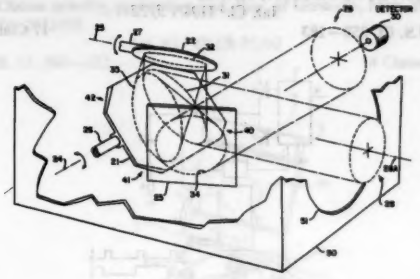
1. An opto-mechanical scanning mechanism for use in an imaging system that scans an object field in two dimensions comprising:

A. vertical-scan planar reflector means (21) positioned to receive radiant energy along a first optical path (28) from an object field and to reflect said radiant energy along a second optical path (27) different from said first optical path,

B. vertical-scan drive means (45) for varying the angular position of said vertical-scan planar reflector means about a first axis (24) that is substantially orthogonal to said first optical path,

C. horizontal-scan planar reflector means (22) positioned to receive said radiant energy reflected from said vertical-scan reflector means along said second optical path (20) and to reflect said radiant energy back onto said vertical-scan reflector means along a third optical path (38) different from said second optical path, said vertical-scan reflector means thereby reflecting said radiant energy along a fourth optical path (39) in a plane different from said first optical path, said fourth optical path leading to an image field,

D. horizontal-scan drive means (46) for varying the angular position of said horizontal-scan planar reflector means about a second axis (25) that is substantially orthogonal to



said second and third optical paths, said first, second and third optical paths being unobstructed,

E. radiant energy detector means (30) for detecting radiant energy in said fourth optical path, and

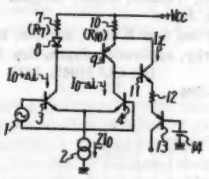
F. optical focusing means (35, 36, 37) for focusing elemental areas of said object field on said radiant energy detector means.

4,347,531

CIRCUIT CONVERTING A PAIR OF DIFFERENTIAL INPUT SIGNALS TO SINGLE-ENDED OUTPUT SIGNALS

Akira Yamakoshi, Saitama; Kyoichi Murakami, and Tsutomu Niimura, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 12, 1980, Ser. No. 186,706
Claims priority, application Japan, Sep. 20, 1979, 54-121341
Int. Cl.³ H04N 5/18
U.S. Cl. 358—172 15 Claims



1. A signal converting circuit comprising:

differential amplifier means having first and second outputs and producing first and second differential currents at said first and second outputs, respectively;

output means for producing an output current in response to one of said first and second differential currents; and

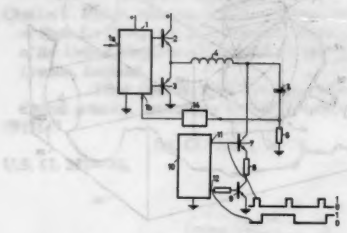
means for controlling the current gain of said signal converting circuit in response to said first and second differential currents, said means for controlling including a first circuit supplied with said first differential current and having first resistive means with a first resistance value, and a second circuit supplied with said second differential current and having second resistive means with second resistance value, the current gain of said signal converting circuit being controlled by the resistance values of said first and second resistive means.

4,347,532

PICTURE DISPLAY DEVICE ARRANGED FOR DISPLAYING A MIXED PICTURE SIGNAL AS AN INTERLACED TELEVISION PICTURE

Jan A. C. Korver, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 14, 1980, Ser. No. 196,407
Claims priority, application Netherlands, Oct. 15, 1979, 7907598; Apr. 25, 1980, 8002410
Int. Cl.³ H04N 5/22
U.S. Cl. 358—183 17 Claims



1. A picture display device having means for displaying as an interlaced television picture on a picture display tube, a mixed picture signal including a television signal produced in accordance with a television standard, a digitally generated picture, and a text information signal, comprising:

means for generating field and line deflection signals for deflecting one or more electron beams when produced in said picture display tube, and

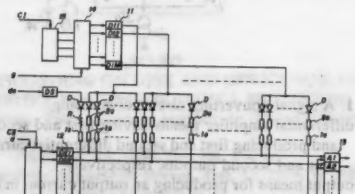
means for generating a signal for additionally deflecting said electron beams in the vertical direction for substantially eliminating the interlace in a portion of said displayed picture in which said digitally generated picture and text information signals are displayed, said additional deflection signal having a picture frequency such that the picture lines displayed on said picture display screen of said picture display tube substantially coincide.

4,347,533

FACSIMILE READING AND RECORDING DEVICE

Mutsuo Ogawa, Yamato, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 2, 1980, Ser. No. 183,279
Claims priority, application Japan, Sep. 6, 1979, 54-113560
Int. Cl.³ H04N 1/22
U.S. Cl. 358—296 10 Claims



1. A reading and recording device comprising:

a read head comprising a plurality of semiconductive photoconductive elements for reading image information,

a record head comprising a plurality of exothermic resistor elements for recording image information, said read head and said record head being substantially the same in circuit arrangement, and

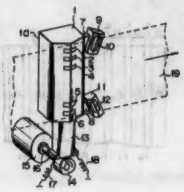
a set of drive circuits which is connected to said read head and said record head and which can be used commonly for reading and recording image information selectively.

4,347,534

AUTO-TRACKING SYSTEM FOR MAGNETIC TAPE RECORDING DEVICE

Kenji Kimura, Tachikawa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1980, Ser. No. 220,180
Claims priority, application Japan, Jan. 18, 1980, 55-4297
Int. Cl.³ G11B 21/10
U.S. Cl. 360—77 9 Claims



1. An auto-tracking system for a multichannel head unit having a plurality of transducers for respective channels, comprising:

a pair of detecting heads having respective center posiitions disposed in positions corresponding respectively to at least two transducers of the multichannel head unit and in close vicinity to a magnetic tape having a plurality of recording tracks, said detecting heads being symmetrically inclined with respect to a tape traveling direction and arranged so that respective center positions of said detecting heads are each in alignment with center positions of the corresponding respective recording tracks of said magnetic tape;

said detecting heads each having a track width greater than that of each of said transducers of said multichannel head unit within a range not reaching a transducer adjacent to the transducer associated with the respective detecting head so as to reproduce signals regularly continuously recorded on the respective recording tracks of said magnetic tape;

tracking error detecting means coupled to said detecting heads for detecting as a tracking error signal a relative change in phase of the reproduced signals from said two detecting heads; and

reproducing position correcting means coupled to said tracking error detecting means for correcting the positions of at least one of said multichannel head unit, said detecting heads, and said magnetic tape in accordance with the tracking error signal from said tracking error detecting means.

4,347,535

READ/WRITE HEAD CARRIAGE ASSEMBLY

Warren L. Dalziel, Monte Sereno, Calif., assignor to Shugart Associates, Sunnyvale, Calif.

Filed Dec. 19, 1977, Ser. No. 861,909
Int. Cl.³ G11B 5/016
U.S. Cl. 360—99 1 Claim

1. A read/write head carriage assembly for a disk recorder comprising:

a carriage member;

an arm pivotally affixed to said carriage member for movement toward and away from a loaded position;

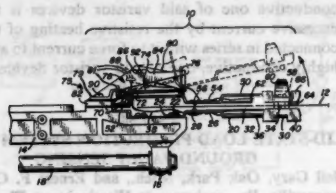
disk engaging means affixed to said arm;

means for biasing said arm toward said loaded position at which said disk engaging means is loaded in compliance with a suitably disposed disk; and

damping means coupled between said carriage member and

said arm for damping motion of said arm toward said loaded position:

said damping means including a bifurcated stop member having first and second finger portions disposed in spaced-apart relationship, and a blade which is at least partially



disposed between and frictionally engaged with said finger portions so as to spread apart said finger portions, thereby developing an opposing frictional force in response to motion between said stop member and said blade, whereby the motion of said arm toward said loaded position is damped.

4,347,536

ROTARY CYLINDER APPARATUS

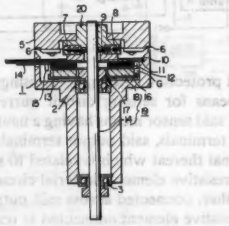
Kunio Miyashita; Tadashi Takahashi, and Shigeki Morinaga, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 4, 1980, Ser. No. 109,499

Claims priority, application Japan, Jan. 10, 1979, 54-687; Jan. 26, 1979, 54-7177

Int. Cl.³ G11B *5/52*

U.S. Cl. 360—107 **13 Claims**



1. A rotary cylinder apparatus comprising:

a rotary drum having a magnetic head mounted thereon;

a brushless motor for driving said rotary drum;

a stationary drum disposed opposite to said rotary drum for housing said brushless motor;

rotational speed detecting means including a detecting coil for detecting the rate of rotation of said brushless motor;

said brushless motor including a shaft connected to said rotary drum, a rotary yoke mounted on said shaft, a multiple permanent magnet rotor supported by said rotary yoke, a stator yoke mounted on a portion of said stationary drum, and a driving coil mounted on said stator yoke opposite to said permanent magnet rotor with a predetermined gap being provided between the driving coil and the stator yoke; and

position detecting means mounted adjacent said driving coil of said brushless motor for detecting the position of said permanent magnet rotor to control the current supplied to said driving coil;

said detecting coil of said rotational speed detecting means being laminated with said driving coil between said stator yoke and said permanent magnet rotor and being disposed in a cross relationship with magnetic flux of said permanent magnet rotor for generating signals representing the rotational speed of said brushless motor.

4,347,537

TAPE CARTRIDGE ASSEMBLY AND TAPE TRANSPORT APPARATUS FOR USE THEREWITH

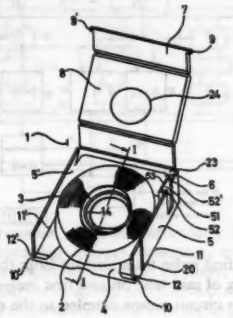
Klaus Schoettle, Heidelberg; Peter Dobler, Ludwigshafen; Lothar Gliniorz, Frankenthal, and Werner Hoffmann, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 27, 1980, Ser. No. 125,036

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1979, 2912423

Int. Cl.³ G11B *23/02*

U.S. Cl. 360—132 **14 Claims**



1. A tape cartridge, in particular a magnetic tape cassette, comprising a housing having a bottom wall, a top wall, two side walls and front and rear walls, and in said housing at least one roll of tape wound on a hub,

wherein the side walls and the rear wall are rigidly attached to the bottom wall, the front wall is releasably connected to the bottom of the side walls and the top wall is a lid which is hingedly connected to the rear wall and the front wall and is foldable into two lid portions, such that the lid, together with the front wall can be folded about an edge of the rear wall against the outer surface of the bottom wall;

wherein the surfaces coming into contact after the folding operation possess releasable connecting means, and

wherein locking means acting on the hub are provided to hold said tape roll(s) in the cartridge housing.

4,347,538

METHOD AND APPARATUS FOR THE MEASUREMENT AND INDICATION OF THE POSITION OF A COILED MATERIAL IN TAPE FORM

Otto Klank, Arpke, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

PCT No. PCT/DE78/00037, § 371 Date Aug. 6, 1979, § 102(e) Date Aug. 6, 1979, PCT Pub. No. WO79/00352, PCT Pub. Date Jun. 28, 1979

PCT Filed Dec. 6, 1978, Ser. No. 129,379

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1977, 2754368

Int. Cl.³ G11B *27/10*

U.S. Cl. 360—137 **14 Claims**

1. Apparatus for indicating the position of a tape wound on first and second reels and movable therebetween, comprising:

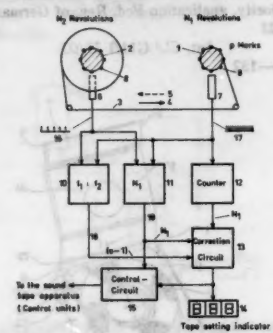
pulse generating means coupled to said first and second reels for generating first and second pulse trains having pulse repetition frequencies corresponding to the angular speeds of said first and second reels, respectively;

frequency ratio means for determining the ratio a of the pulse repetition frequency of said first pulse train to the pulse repetition frequency of said second pulse train, said

determination being made when one of said reels has substantially no tape wound thereon;

turns counting means for determining the maximum total number of turns N_{1gr} of tape on one of said reels when said reel is completely loaded;

pulse counting means coupled to said pulse generating means for counting the number of accumulated pulses N_1



in said first pulse train starting from the beginning of the winding of said tape on said first reel; and

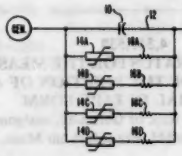
correction circuit means coupled to the outputs of said frequency ratio means, turns counting means and pulse counting means, the output of said correction circuit means corresponding to the position L of the tape on said first reel.

4,347,539

ELECTRICAL EQUIPMENT PROTECTIVE APPARATUS WITH ENERGY BALANCING AMONG PARALLEL VARISTORS

Charles A. Peterson, Van Buren Township, Monroe County, and Robert T. Innis, Bloomington Township, Monroe County, both of Ind., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 3, 1981, Ser. No. 270,176
Int. Cl.³ H02H 7/16
U.S. Cl. 361—16 **6 Claims**



1. Electrical equipment overvoltage protection apparatus comprising:

a plurality of varistor devices connected mutually in parallel for connection across the protected electrical equipment, each of said varistor devices exhibiting a drop in resistance value to become highly conductive upon application of a voltage of a magnitude that would be injurious to the protected electrical equipment, the total number of said plurality of varistor devices being sufficient to absorb without damage the energy associated with an anticipated fault current; and,

current sharing means connected with said plurality of varistor devices for insuring approximate equality of current conducted, and hence energy absorption required, by respective ones of said plurality of varistor devices despite inherent variation in the conduction characteristics of the varistor devices themselves;

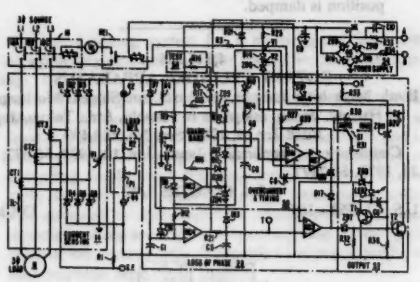
said current sharing means comprising a plurality of resistors connected respectively in series with said plurality of varistor devices, said resistors each having a positive temperature coefficient of resistance so a more highly conductive one of said varistor devices is relieved of excessive current by the resistive heating of the resistor connected in series with it to force current to another, less highly conductive, one of said varistor devices.

4,347,540

SOLID-STATE LOAD PROTECTION SYSTEM HAVING GROUND FAULT SENSING

Wardell Gary, Oak Park, Mich., and Ernest F. Conroy, Jr., Monroeville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 27, 1981, Ser. No. 258,106
Int. Cl.³ H02H 3/16
U.S. Cl. 361—47 **38 Claims**



1. A load protection system, comprising:

sensor means for sensing circuit current in an electrical circuit, said sensor means having a neutral leg and a pair of output terminals, said output terminals providing an output signal thereat which is related to said circuit current;

a pair of resistive elements in serial circuit relationship with each other, connected across said output terminals;

a third resistive element connected at one end between said pair of resistive elements and at the other end to said neutral leg;

ground fault sensing means connected across said output terminals and to said neutral leg for producing a trip signal upon detecting a current flow in said third resistive element during a ground fault; and

circuit control trip means connected to said ground fault sensing means and to said electrical circuit for opening said electrical circuit when said trip signal is provided.

4,347,541

CIRCUIT BREAKER

Wen T. Chen, West Newton, and Vincent C. Oxley, Wayland, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jan. 14, 1981, Ser. No. 225,067
Int. Cl.³ H02H 9/08
U.S. Cl. 361—50 **5 Claims**

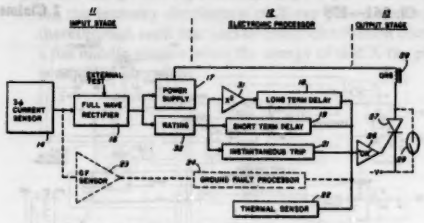
1. An improved circuit breaker including a solenoid for actuation in an event of an electrical overload, wherein the improvement comprises

means for sensing current through an electrical circuit subject to interruption by said circuit breaker in the event of an electrical overload;

means for converting the sensed current to a voltage proportional thereto;

means for detecting an excess of said proportional voltage over a predetermined voltage;

means for squaring the excess of said proportional voltage;



voltage controlled oscillator means responsive to the squared excess voltage for providing signals during a presence of said excess voltage; and

means for counting said signals, and, upon reaching a predetermined count, actuating said solenoid.

4,347,542

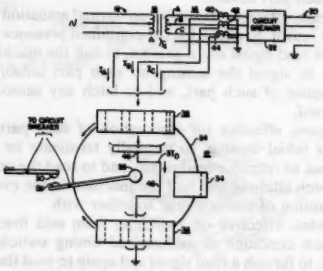
RATIO GROUND RELAY

Howard J. Calhoun, Coral Springs, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 20, 1981, Ser. No. 245,769

Int. Cl.³ H02H 3/26

U.S. Cl. 361—76 **6 Claims**



1. An induction disc ratio ground relay for detecting open phases and phase-to-ground faults in a three-phase electrical power system, having means providing signals responsive to the three phase currents and the zero sequence current at the relaying point, a first electromagnet which provides an operating torque which is a function of the zero sequence current, and a second electromagnet having a three-legged magnetic core structure and electrical windings which are energized by the three phase current signals to provide a restraining torque which is a function of the positive sequence current minus the negative sequence current, and electrical contacts actuatable in response to a predetermined relationship between the operating and restraining torques, the improvement comprising: the windings of the second electromagnet are arranged on at least two of the three legs of the three-legged magnetic core structure and energized by the three phase current signals such that the length of the magnetic flux path is the same for each of the three possible phase-to-ground faults, to provide similar restraining torques for similar faults, regardless of the faulted phase.

4,347,543

RECTIFIER CIRCUIT DIODE ARRAY AND CIRCUIT PROTECTOR

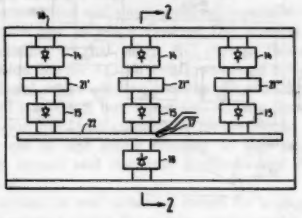
Manfred Frister, Schwieberdingen, and Friedhelm Meyer, Illingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 9, 1980, Ser. No. 214,516

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1979, 2950073

Int. Cl.³ H02H 3/20

U.S. Cl. 361—91 **8 Claims**



1. In a rectifier circuit structure particularly for use in a motor vehicle alternating current generator, comprising a plurality of diodes (14,15) arranged in an array, at least one connection plug (21) for coupling an input AC signal to said rectifier circuit, an electrically conductive cooling device (18) defining a recess, said cooling device (18) comprising a first output terminal of said rectifier circuit, and in which at least one positively poled diode (15) and at least one negatively poled diode (14) and an associated connection plug (21) are disposed one above the other in the form of a column and located in said recess of said cooling device, and a second output terminal (22),

comprising in accordance with the invention:

a Zener diode (16) in said column and connected between the output terminals (18,22) of said rectifier circuit and being polarized in the blocking direction during normal operation of said diodes (14,15) of said rectifier circuit, the breakdown voltage value of said Zener diode (16) being greater than the normal output voltage of said rectifier circuit;

said second output terminal (22) of said rectifier circuit being arranged in said column in contact with and between said Zener diode (16) and one of said diodes (15);

an electrode terminal of one of said diodes (14) and the corresponding electrode terminal of said Zener diode (16) being in direct and conductive contact with said cooling device (18); and

a temperature-sensing element (17) disposed on said second output terminal (22) for sensing the temperature of said Zener diode (16) and said second output terminal (22).

4,347,544

INJECTOR DRIVE CIRCUIT

Masahiro Ohba, Okazaki, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 21, 1980, Ser. No. 209,119

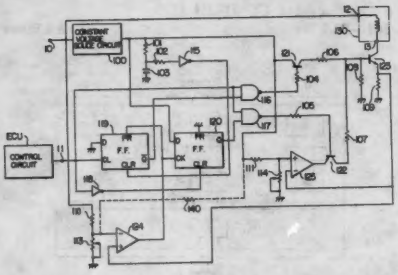
Claims priority, application Japan, Nov. 28, 1979, 54-153983

Int. Cl.³ H01H 47/32

U.S. Cl. 361—154 **6 Claims**

1. An injector drive circuit for driving an injector having a valve opened and closed according to a pulse signal with the pulse duration thereof corresponding to the quantity of fuel supplied to the engine, comprising a power transistor with the collector-emitter path thereof connected in series with an injector coil for supplying current to said injector coil for the pulse duration of said pulse signal, a first comparator circuit section for determining whether a peak current of a predetermined value has been caused to flow through said injector coil

after the appearance of said pulse signal or not, a second comparator circuit section for determining whether a working current of a preset value has been caused to flow through said injector coil after the peak current has been caused through said injector coil or not, a first current control section for supplying current to the base of said power transistor for a period until said first comparator circuit section detects said



peak current through said injector coil during the presence of said pulse signal, and a second current control section for supplying current to the base of said power transistor only when said second comparator circuit section determines that no working current is flowing through said injector coil after the detection of said peak current through said injector coil by said first comparator circuit section during the presence of said pulse signal.

4,347,545

BURGLARPROOFING DEVICE FOR AUTOMOTIVE VEHICLES

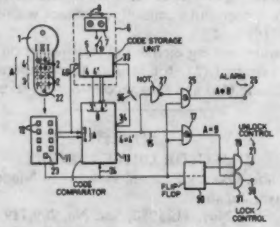
Walter Weishaupt, Munich, and Hans-Dieter Fournell, Haar, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke A.G., Munich, Fed. Rep. of Germany

Filed Jul. 16, 1980, Ser. No. 169,359

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1979, 2928913

Int. Cl.³ H01H *47/34*

U.S. Cl. 361—172 **18 Claims**



1. Burglarproofing device for automotive vehicles with a code transmitter for a settable code, with a code storage unit for a stored code corresponding to the settable code, with a code reader, and with a code comparator, which latter makes it possible to use the automotive vehicle in case of coincidence between the settable code and the stored code, characterized in that the stored code consists of two partial codes, of which the first partial code can be re-stored in the rest condition of the device and upon coincidence of the second partial code with the corresponding partial code of the code transmitter.

4,347,546

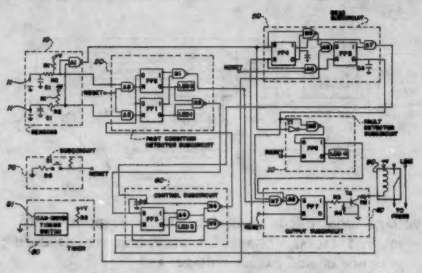
LOGIC CIRCUIT FOR PART DETECTOR

Paul J. Unnerstall, 6319 Mackenzie Ct., St. Louis, Mo. 63123

Filed Aug. 25, 1980, Ser. No. 180,998

Int. Cl.³ H02H *5/00*

U.S. Cl. 361—179 **2 Claims**



1. For use with that type of machine transferring a succession of items and characterized by having dwell periods, during which such items are inspected for the presence or position of a part, alternating with periods of transfer movement, and utilizing an electrical part sensor whose normal actuation and deactuation occur during such dwell period,

inspection circuitry comprising

timing switch means having a first and second condition and changing therebetween in response to the progress of the machine, the second switch condition being associated with machine transfer movement and the first condition being associated with machine dwell, in combination with

(a) means, effective on the switching of said switch means from said second condition to said first condition, for canceling both a prior read signal and the prior latching of such part sensor,

(b) means, effective thereafter on normal actuation of such part sensor, to check for the continued presence of such prior read signal and if present, to halt the machine, and also to signal the sensing by such part sensor of the presence of such part, and to latch any sensor signal thereof,

(c) means, effective on deactuation of such part sensor after initial sensing, to normally terminate its sensing signal, to furnish a read signal, and to read the condition of such latching and halt the machine in the event of a condition of non-latching, together with

(d) means, effective on switching from said first timing switch condition to said second timing switch condition, to furnish a read signal and again to read the condition of such latching and of the then condition of sensing by the part sensor, and to halt the machine in the event either of a condition of non-latching or the then presence of a sensor signal, said read signal to be normally deactuated thereafter on switching from said second timing switch condition to said first condition as set forth in (a) hereinabove.

whereby halting of the machine in any of the events mentioned in paragraphs (b), (c) and (d) above will occur during the machine dwell period in the event of failure of the timing switch or the abnormal presence of a sensor signal, as well as in the event of failure to latch.

4,347,547

ENERGY INTERLOCK SYSTEM FOR A LINEAR ACCELERATOR

Robert Gibson, Walnut Creek, Calif., assignor to Siemens Medical Laboratories, Inc., Walnut Creek, Calif.

Filed May 22, 1980, Ser. No. 152,486

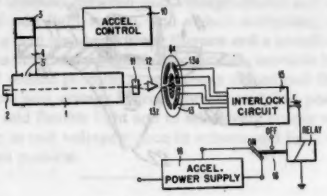
Int. Cl.³ H01H *47/24*

U.S. Cl. 361—187 **6 Claims**

1. An X-ray energy monitoring system for the supervision of

a linear accelerator of the type having no electron beam bending system, said accelerator emitting electron pulses which are directed to a target for generation of X-ray pulses, comprising in combination:

(a) a flattening filter exposed to said X-ray pulses for flattening the intensity distribution of X-ray pulses transmitted therethrough such that said intensity distribution contains a flat middle portion when the energy of said X-ray pulses is adjusted correctly;



(b) an ionization chamber for measuring the intensity distribution of said transmitted X-ray pulses;

(c) discriminator means connected to said ionization chamber for determining flatness deviations in the intensity distributions of said transmitted X-ray pulses, each such flatness deviation being an indication of a change of said correctly adjusted X-ray energy; and

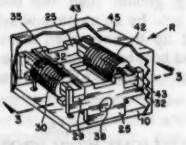
(d) switch means operated by said discriminator means dependent upon said flatness deviations, for interlocking the operation of said linear accelerator.

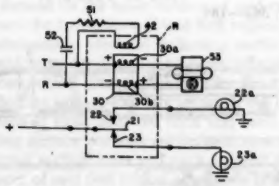
4,347,548

ELECTRICAL RELAY

Anthony E. Sprando, 3115 NW. Cornell Rd., Portland, Oreg. 97210

Filed Feb. 27, 1981, Ser. No. 238,846
Int. Cl.³ H01H *47/04*
U.S. Cl. 361—210 **8 Claims**





1. An electromagnetic relay for use with a transmission line that transmits AC current under one condition and DC current under another condition, said relay comprising:

base plate means of insulating material having stationary contact means and movable contact means thereon;

frame means mounted on said base plate means;

armature means of magnetizable material having a cross member and arm means extending outwardly from opposite sides of said cross member;

means pivotally mounting said armature means to said frame means about an axis extending through said cross member with said arm means being disposed in a plane which is substantially parallel to said base plate means so that said arm means can move toward and away from said base plate means;

first coil means disposed adjacent one of said arm means and having bifilar windings for series connection with the transmission line;

second coil means disposed adjacent the other of said arm means and having a single winding;

means for connecting said single winding in parallel with the transmission line to block flow of DC current to said single winding so that when AC current flows in the transmission line the AC current flows in said bifilar windings and said single winding causing said armature means to remain stationary, but, when DC current flows in the transmission line, said connecting means blocks flow of DC current to said single winding so that said bifilar windings attract said one arm means to said first coil means; and

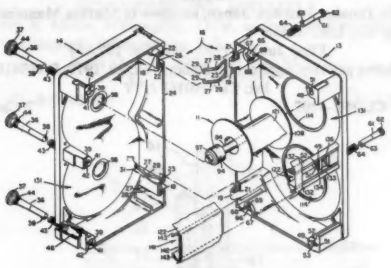
actuating means on said armature means for engaging said movable contact means for moving said movable contact means into engagement with and disengagement with said stationary contact means when said one arm means is attracted to said first coil means.

4,347,549

ANTI-STATIC STRUCTURE FOR MAGNETIC TAPE GUIDES

Erno H. Fechner, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 24, 1980, Ser. No. 132,715
Int. Cl.³ H05F *3/00*
U.S. Cl. 361—212 **3 Claims**



1. An anti-static shield for a tape guide post arranged for confronting only one flat face of said tape, comprising:

a shield member attachable to said guide post and covering the tape-confronting portions thereof to define a bearing surface for said tape; and

said shield member being formed of electrically conductive material and being electrically coupled only to said one tape face.

4,347,550

SENSOR DETECTOR ELEMENT FOR AN ELECTRICAL HYGROMETER

Peter Rockliff, 45, Heath Dr., Boston Spa, Yorkshire, England

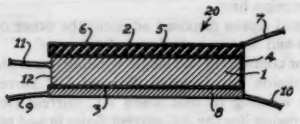
Continuation-in-part of Ser. No. 863,472, Dec. 22, 1977, abandoned. This application May 28, 1980, Ser. No. 153,902
Int. Cl.³ H01G *7/00*
U.S. Cl. 361—286 **3 Claims**

1. A detector element of capacitance type for use in an electrical hygrometer comprising:

(a) a first electrode comprising a substrate of silicon doped to render it electrically conductive and having at least one surface,

(b) at least said one surface being thermally oxidized to produce a thin, moisture-impermeable barrier layer of silicon oxide,

(c) a dielectric layer of insoluble hygroscopic material upon and supported by said barrier layer on said one surface,



(d) a moisture permeable second electrode upon and supported by said dielectric layer, and

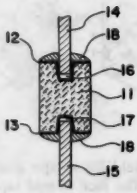
(e) said moisture-impermeable barrier layer of silicon oxide effectively eliminating electrical conductivity between said first and second electrodes, and causing said electrodes to function strictly capacitively.

4,347,551

CERAMIC CAPACITOR WITH TERMINALS IN SOCKETS

Yukio Tanaka, Tsuruga, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Jun. 9, 1980, Ser. No. 157,864
Claims priority, application Japan, Jun. 20, 1979, 54-85418[U]
Int. Cl.³ H01G 1/14
U.S. Cl. 361—307 **7 Claims**



1. A ceramic capacitor arrangement, comprising:

a substantially axially elongated body shaped as a cylinder, made of a ceramic material and having opposite ends, first and second sockets formed at opposite ends of said elongated body, respectively, each of said sockets being narrowed in a direction axially inwardly of the body;

first and second electrode films deposited on said opposite ends, respectively;

first and second terminal pins each having a straightened portion pressure-fitted into said first and second sockets, respectively; each of said end portions being of uniform cross-section along the length thereof; and

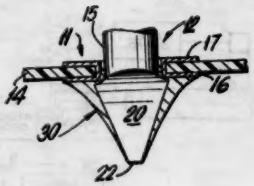
first and second solder beads deposited on opposite ends of the elongated body, respectively, in intimate contact with said pins and said electrode films.

4,347,552

ASSEMBLY OF ELECTRICAL COMPONENTS WITH SUBSTRATES

Robert E. Pearcy, and James E. Raus, both of Indianapolis, Ind., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Apr. 14, 1980, Ser. No. 140,263
Int. Cl.³ H05K 1/00
U.S. Cl. 361—398 **9 Claims**



1. An assembly comprising:

(a) a substrate having a mounting hole threthrough; and

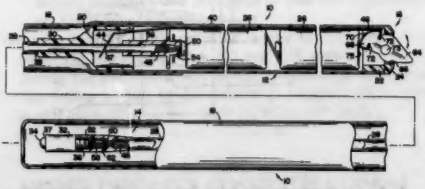
(b) an electrical component mounted on the substrate; the component having a body portion and at least one lead of malleable conductive metal having a cylindrical shank portion extending from the body portion into and at least partway through the hole with a radial clearance from the wall of the hole less than the radius of such shank portion, the lead moreover having an arrowhead-shaped tip formed at the end thereof and integrally joined to said shank portion and positioned on the opposite side of the substrate from the component body for mechanically fastening the lead and component to the substrate, such tip being constituted of solid metal over the full extent of the dimensions occupied by such tip, the tip having barbs disposed rearward of the end of the tip, said barbs being characterized by respective backward facing points at the transversely outer extremities of said tip, and by respective surfaces extending from such points to said shank portion so as to be engageable with said opposite side of said substrate without a significant wedging effect on the side of said hole, the width between the points of such barbs being greater than the corresponding distance across the hole by an amount which is small enough to permit said tip to have been manually forced forward through said hole but which is large enough to produce a positive lock between such barbs and such substrate.

4,347,553

FLEXIBLE LIGHT WITH PROTECTIVE CAP

John R. Saron, 6638 Mango South, St. Petersburg, Fla. 33707

Filed Oct. 26, 1981, Ser. No. 314,721
Int. Cl.³ F21L 3/00
U.S. Cl. 362—189 **9 Claims**



1. A light comprising an outer housing configured to retain a voltage source therein having an extended bulb assembly mounted within one end thereof, a protective cap removably attached to said outer housing disposed to enclose said extended bulb assembly when said light is not in use, and a switch pivotally mounted on the opposite end thereof, said extended

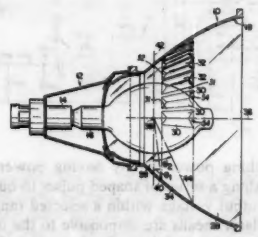
bulb assembly comprises an elongated hollow flexible sleeve disposed within said protective cap when said light is not in use, said extended bulb assembly having a mounting member attached to one end thereof to attach said extended bulb assembly to said outer housing and a bulb housing having a light source at least partially disposed therein attached to the opposite end thereof, a first conductor extending substantially the length of said flexible light coupled to said light source, a second conductor disposed within said elongated hollow flexible sleeve coupled between said voltage source and another portion of said light source, said switch comprising a body including a cam member formed thereon and a switch contact attached to said cam member being pivotally movable between a first and second position to selectively isolate said first conductor from said voltage source when in said first position to deactuate said flexible light and to selectively couple said first conductor to said voltage source to actuate said light when in said second position.

4,347,554

LUMINAIRE

Nobuo Matsushita, Tokyo, Japan, assignor to Toshiba Electric Equipment Corporation, Tokyo, Japan

Filed Sep. 18, 1980, Ser. No. 188,491
Claims priority, application Japan, Sep. 21, 1979, 54-122410
Int. Cl.³ F21V 7/00
U.S. Cl. 362—297 **16 Claims**



1. A luminaire comprising:
a light source;
a reflector surrounding the light source and reflecting light emitted by the light source to a desired direction;
said reflector including a first region formed on the inner surface of said reflector, located at first and second places, said first place being located adjacent a light projecting end portion of said reflector and said second place being located adjacent a base end portion of said reflector and each having a smooth reflecting surface; and
a second region formed on the inner surface of said reflector disposed between the two places of said first region;
a plurality of substantially identical reflecting surface units positioned in said second region, each having slanted opposite side portions which intersect each other wherein the plurality of reflecting surface units are arranged in a circumferential direction at fixed intervals such that each of said smooth reflecting surface portions are defined between two adjacent reflecting surface units and each connect the first and second places of said first region, wherein a first imaginary straight line segment connecting a first end of the reflecting surface unit and the light center of the light source forms a first fixed angle with a reference plane normal to the axis of the reflector and containing the light center, a second imaginary straight line segment connecting a second end of the reflecting surface unit and the light source which forms a second fixed angle with the reference plane, and wherein said reflector in said first and second regions further comprises a multilayer structure including a base member forming the shape of the reflector, a high reflecting film deposited on the base member, and a transparent protective film deposited on the high reflecting film.

4,347,555

COMPOUND BEAM ILLUMINATING

William B. Elmer, 2 Chestnut St., Andover, Mass. 01810

Division of Ser. No. 49,087, Jun. 18, 1979, Pat. No. 4,288,847.
This application Apr. 16, 1981, Ser. No. 254,945
Int. Cl.³ F21V 7/00
U.S. Cl. 362—299 **6 Claims**

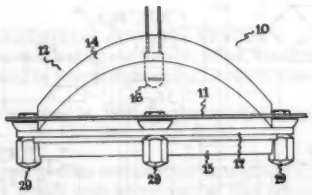
1. Illuminating apparatus comprising,
a light source,
a relatively opaque diffuse reflector having a principal light emitting opening for reflecting light from said source through said opening in a first primary light beam in a first principal direction of maximum illumination,
and transflecting means adjacent to said light source for receiving light therefrom and transmitting a portion of the received light for use by an observer and reflecting back another part of said received light toward the interior of said reflector for illumination reinforcement of said first primary light beam.

4,347,556

VEHICLE HEADLAMP HAVING AN INTEGRAL TRIM RIM MOUNTING ASSEMBLY

Robert N. Malm, Willoughby, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 16, 1979, Ser. No. 85,454
Int. Cl.³ F21V 7/00
U.S. Cl. 362—307 **11 Claims**



1. A sealed beam headlamp assembly comprising an envelope, having a reflector and light transmissive lens, a light source sealed within and focused relative to said envelope, and a trim rim integrally molded with and projecting outwardly from the exterior of said envelope, said rim having a plurality of openings therein for receiving studs therethrough.

4,347,557

SWIVEL JOINT

Jerome Warshawsky, Baldwin Harbor, N.Y., assignor to I. W. Industries, Inc., Melville, N.Y.

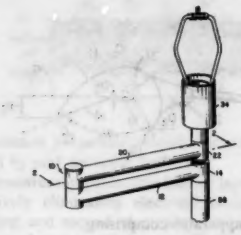
Division of Ser. No. 28,102, Apr. 9, 1979, Pat. No. 4,247,886.
This application Aug. 29, 1980, Ser. No. 182,786
Int. Cl.³ F21M 3/18
U.S. Cl. 362—427 **14 Claims**

1. A swivel joint assembly comprising:
a. a first tubular arm member having a first end joint on one

end and a connecting tubular element on the other end, said first end joint having an arcuate groove thereon;

b. a second tubular arm member having a second end joint on one end and a connecting tubular element on the other end substantially identical to said connecting tubular element on said first tubular arm, said second end joint having stop means thereon for limiting rotational movement of said swivel joint to approximately 360°; and

c. a base, connected to said connecting tubular element of said first tubular arm member; and



d. a light fixture connected to said connecting tubular element of said second tubular arm member; and

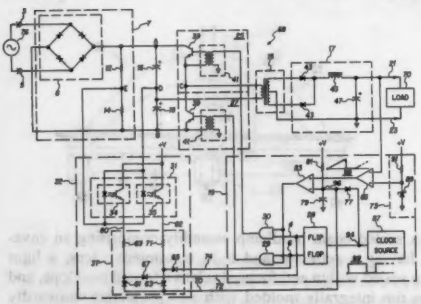
e. swivel means for providing rotational movement between said first and second end joints, including fastener means for securing said first and second end joints to each other, whereby said stop means protrudes into said arcuate groove and a stop shoulder on said arcuate groove coacting with said stop means to limit rotational movement of said swivel joint.

4,347,558

VOLTAGE BALANCE CONTROL FOR SPLIT CAPACITORS IN HALF BRIDGE DC TO DC CONVERTER

Wayne A. Kalinsky, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 2, 1981, Ser. No. 250,520
Int. Cl.³ H02M *3/335*; H02P *13/22*
U.S. Cl. 363—17 **4 Claims**



1. A DC to DC converter, comprising:

a DC to AC inverter means for inverting a first signal to obtain a second signal including a bridge network with a series connection of a first capacitor connected to a second capacitor at a first node, a first switch connected to the second capacitor at a second node, a second switch connected to the first switch at a third node, and a fourth node that connects the second switch to the first capacitor;

output AC to DC converter means for converting the second signal into a third signal;

transformer means for coupling the second signal from the inverter means to the output AC to DC converter means, a primary of which is connected between the first and third nodes and the secondary is connected across the input to the output AC to DC converter;

control signal generator means for generating a first control signal for controlling the first switch and a second control signal for controlling the second switch such that, when activated, the first switch places the first capacitor electrically across the primary winding and when activated the second switch places the second capacitor electrically across the primary winding; and

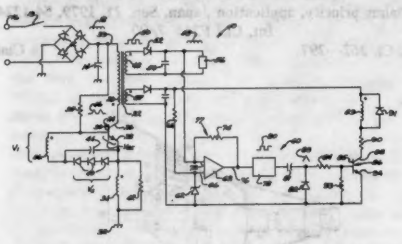
voltage balance control means for sensing a voltage imbalance across the first and second capacitors and for modifying the operation of the control signal generator means in response to a sensed voltage imbalance to cause the inverter means to compensate for the sensed voltage imbalance.

4,347,559

SWITCHING POWER SUPPLY

Clayton L. Sturgeon, Johnson City, Tenn., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 2, 1981, Ser. No. 239,856
Int. Cl.³ H02M *3/335*
U.S. Cl. 363—21 **12 Claims**



1. In a switching power supply having power switching means for furnishing a series of shaped pulses to output means to provide an output voltage within a selected range, voltage controlled oscillator means are responsive to the output voltage for providing control pulses representative of the output voltage level, and means magnetically responsive to the control pulses are magnetically coupled to the power switching means for driving the switching means to regulate the output voltage to be within said selected range, the magnetic means comprising saturable transformer means having first winding means and having other winding means magnetically coupled to the first winding means, the first winding means being responsive to the control pulses to provide corresponding driving pulses in the other winding means for driving the switching means to regulate the output voltage to be within said selected range.

4,347,560

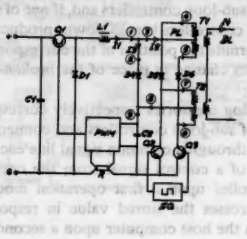
SQUARE WAVE GENERATOR

Ole S. Seiersen, Kokkedal, Denmark, assignor to Christian Rovsing A/S, Ballerup, Denmark

Filed Mar. 20, 1981, Ser. No. 245,988
Claims priority, application Denmark, Mar. 21, 1980, 1232/80
Int. Cl.³ H02M *3/335*
U.S. Cl. 363—24 **1 Claim**

1. A square wave generator for the supply of power to at least one unit which is selectively connectable to a busline, said generator having a source of current which through an inductance applies a pulsating direct current to a center tap of a primary winding of a transformer through one of two direct current conductors, said primary winding having ends connected to the other of said two direct current conductors through respective alternately conductive static switches thereof, wherein the generator comprises a second output

transformer having a primary winding connected in parallel to the primary winding of the first output transformer through diodes and having a center tap which is connected to the direct



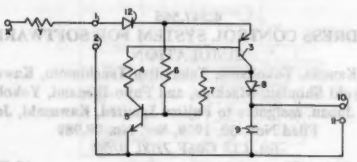
current conductors through a diode and a capacitor, respectively, the secondary windings of the two transformers being connected in series in the busline.

4,347,561

ALTERNATING CURRENT TO DIRECT CURRENT POWER SUPPLY

Norvel J. McLellan, 1002 N. Main St., Pleasanton, Tex. 78064

Filed Dec. 17, 1980, Ser. No. 217,406
Int. Cl.³ H02M *1/14*
U.S. Cl. 363—45 **4 Claims**



1. A alternating current to direct current power supply that has a power input terminal that is connected to one lead of a diode and the other lead of said diode is connected to one lead of a resistor and to the emitter of a PNP transistor and the other lead of said resistor is connected to the base of a NPN transistor and the emitter of said NPN transistor is connected to a second power input terminal and the base of said PNP transistor is connected to one lead of a second resistor and the other lead of said second resistor is connected to the collector of said NPN transistor and one lead of a second diode is connected to the collector of said PNP transistor and the other lead of said second diode is connected to one lead of a capacitor and the other lead of said capacitor is connected to said second power input terminal and one lead of a third resistor is connected to the collector of said PNP transistor and the other lead of said third resistor is connected to the base of said NPN transistor and a positive power output terminal is connected to the junction of said second diode and said capacitor and a negative power output terminal is connected to said second power input terminal.

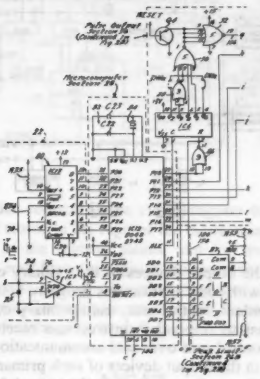
4,347,562

DIGITAL POWER CONVERTER TRIGGER

James H. Galloway, New Baltimore, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Filed Jun. 23, 1980, Ser. No. 161,896
Int. Cl.³ H02P *13/26*
U.S. Cl. 363—87 **22 Claims**

1. In a static converter for converting between a three phase a-c voltage and a d-c voltage by means of a rectifier circuit comprising at least one controlled rectifier associated with each phase and wherein the conduction of such one controlled rectifier is controlled by trigger pulses applied to a gate electrode with one of the a-c and d-c voltages being variable in magnitude by controlling the time of occurrence at which the trigger pulses are applied to the gate electrode, an improved controlled trigger circuit comprising: timing means for digitally timing the interval between phases relative to a determinable time occurrence of at least one phase of the three phase a-c and for determining therefrom a trigger sequence number representative of sixty electrical degrees and for providing the trigger pulses upon attainment of a digital count of said trigger sequence number which is representative of the time between successive trigger pulses whereby said time of occurrence for the trigger pulses will be controlled, regulation means responsive to variations in magnitude of at least one of the voltage and current of one of the a-c and d-c voltages and for digitally providing an error number varying in magnitude in response to such variations, control circuit means responsive to said error number for varying the magnitude of said trigger sequence number at said timing means whereby the time between successive trigger pulses will be varied and hence said time of occurrence will be varied to regulate the magnitude of said at least one of the voltage and current, and fixed frequency clock means for providing clock pulses at a fixed known frequency from which the timing functions are performed.



4,347,563

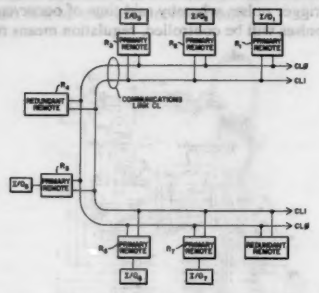
INDUSTRIAL CONTROL SYSTEM

Candelario Paredes, Dallas, and Billy R. Slater, Plano, both of Tex., assignors to Forney Engineering Company, Carrollton, Tex.

Filed Jun. 16, 1980, Ser. No. 159,597
Int. Cl.³ G06F *15/46, 11/00*
U.S. Cl. 364—137 **7 Claims**

1. A distributed process control system comprising a plurality of primary control units interconnected by a communications link, each of said primary control units having a central processing unit and a plurality of input/output devices connected thereto, said input/output devices sensing the condition of and controlling the operation of a process, the central processing unit of each of said primary control units containing a stored applications program which responds to the condition of input devices connected thereto and controlling the output devices connected thereto in accordance with said applications program, each of said primary control units being operable to receive data from and transmit data to each of the other primary control units over said communications link, at least one redundant control unit connected to said communications link and operable to receive data from and transmit data to each of said primary control units connected to said communications link, said redundant control unit comprising a central processing unit with a stored program and comprising means to monitor said primary control units and to respond to the central

processing unit of one of said primary control units failing to carry out its stored applications program, to carry out such applications program in the central processing unit of the redundant control unit, said redundant control unit receiving data from said one of said primary control units representing the condition of the input and output devices of the primary control unit over said communications link and sending instructions to said one of said primary control units to direct



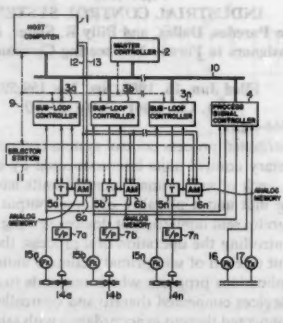
changes in the output devices of the primary control unit in accordance with such applications program being carried out in said redundant control unit, each primary control unit including means to respond to instructions received from said redundant control unit over said communications link directing changes in the output devices of such primary control unit to effect corresponding changes in the output devices of such primary control unit.

4,347,564

HIERARCHICAL-STRUCTURE PLANT CONTROL SYSTEM

Akira Sugano, and Eiji Tooyama, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 25, 1980, Ser. No. 162,890
Claims priority, application Japan, May 2, 1979, 54-53330
Int. Cl.[3] G06F *15/46, 15/16, 11/16*
U.S. Cl. 364—132 **6 Claims**



1. A hierarchical-structure plant control system comprising:

a master controller for computing a plurality of control command signals which are provided respectively corresponding to a plurality of operation terminals of a plant;

a plurality of sub-loop controllers each connected to the master controller through a system bus, and each of which is supplied with the corresponding one of said plurality of control command signals to produce a control output for controlling the positions of the corresponding one of the plurality of operation terminals on the basis of a stored control program;

a host computer for storing a part of the control programs for the plurality of sub-loop controllers and, if one of said plurality of sub-loop controllers breaks down, producing a command which permits the position of the corresponding operation terminal to change in place of the broken-down sub-loop controller;

a plurality of analog memories respectively corresponding to said plurality of sub-loop controllers and connected to said host computer through a common signal line each of which stores a value of a control signal from the corresponding sub-loop controller upon a first operation mode, and increases or decreases the stored value in response to the command from the host computer upon a second operation mode, and

transmitting means for, when one of the plurality of sub-loop controllers breaks down, transmitting the failure occurrence information to said host computer, supplying an output of the analog memory corresponding to the broken-down sub-loop controller to the corresponding operation terminal in place of the output of the broken-down sub-loop controller, and changing the operation mode of the corresponding analogy memory into the second operation mode.

4,347,565

ADDRESS CONTROL SYSTEM FOR SOFTWARE SIMULATION

Saburo Kaneda, Yokohama; Takamitsu Tsuchimoto, Kawasaki; Kazuyuki Shimizu, Machida, and Fujio Ikegami, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 30, 1979, Ser. No. 98,989
Int. Cl.[3] G06F *7/00, 9/00*
U.S. Cl. 364—200 **10 Claims**

1. An address control system for software simulation in a data processor, wherein the data processor has a prefix processing unit for producing an absolute address signal, coordinates logical and real addresses of a virtual machine simulated program and a virtual machine monitor simulator program in a main memory, and simulates the execution of a simulated instruction by the execution of at least one of the instructions of the virtual machine monitor simulator program, said system comprising:

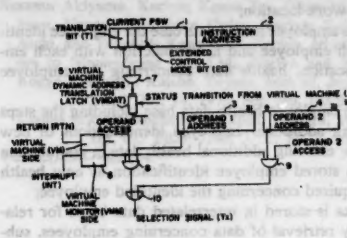
first means for holding information for discriminating the operating state of the virtual machine monitor simulator program and the operating state of the virtual machine simulated program;

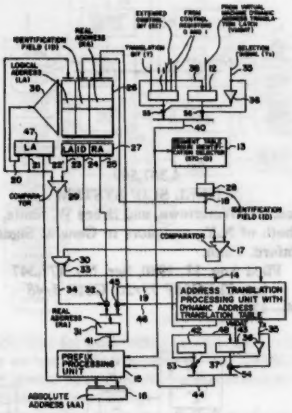
second means, operatively connected to the prefix processing unit, for holding preceding address translation control information and a preceding prefix signal which are both used by the data processor for coordinating a simulated logical operand address with a simulated real operand address in the main memory, when the simulation is performed by the virtual machine monitor simulator program;

third means, operatively connected to the prefix processing unit, for holding current address translation control information and a current prefix signal which are both used by the data processor for coordinating a simulator logical operand address with a simulator real operand address in the main memory; and

fourth means, operatively connected to said first, said second and said third means, for indicating the selection of the contents of either said second means or said third means as a translation input to the prefix processing unit of the data processor during the operation of the simulator program, the contents of said second means being selected

when a simulated operand to be used resides in the virtual machine simulated program, and the contents of said third




LOGICAL ADDRESS (LA)
REAL ADDRESS (RA)
ADDRESS TRANSLATION PROCESSING UNIT WITH DYNAMIC ADDRESS TRANSLATION TABLE
PREFIX PROCESSING UNIT
ABSOLUTE ADDRESS (AA)

means being selected when a simulator operand to be used resides in the virtual machine monitor simulator program.

4,347,566

DATA PROCESSOR WITH REGISTER FILE AND ARITHMETIC LOGIC CIRCUIT ON ONE CHIP AND REGISTER MEANS DIRECTLY CONNECTED TO THE CHIP

Akira Koda; Fumitaka Sato, both of Ome, and Shinji Nishibe, Hachioji, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 5, 1979, Ser. No. 100,447

Claims priority, application Japan, Dec. 11, 1978, 53-151928; Dec. 11, 1978, 53-151929

Int. Cl.³ G06F *9/34*

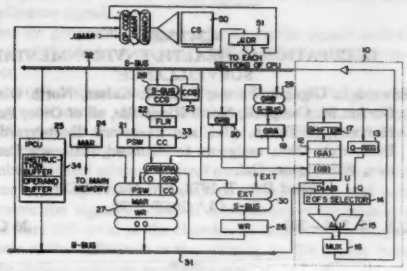
U.S. Cl. 364—200 **11 Claims**

1. A data processor controlled by a microprogram for executing a user instruction comprising:

a semiconductor logic circuit including register file means having a plurality of addressable locations for storing information, at least one of which is for storing an operand, the semiconductor logic circuit further including an arithmetic logic circuit and selector means provided between the register file means and the arithmetic logic circuit for selectively transferring information from the register file means to the arithmetic logic circuit, the arithmetic logic circuit, the selector means and the register file means being part of the same chip, the register file means having an input through which the addressable locations can be addressed and the chip having a terminal coupled to said input;

register means connected directly to the chip terminal to which the input of the register file means of the semiconductor logic circuit is coupled for storing an address of one of the addressable locations of the register file means;

means for writing into the register means an address from the user instruction of an addressable location of the register file means for storing an operand;



means under control of the microprogram for reading an operand stored in the register file means using the address written in the register means, and for transferring the operand read from the register file means to the arithmetic logic circuit through the selector means, the arithmetic logic circuit executing an operation of the user instruction while the microprogram is being executed.

4,347,567

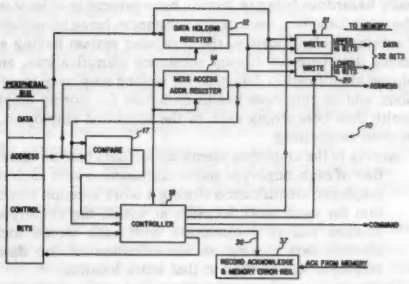
COMPUTER SYSTEM APPARATUS FOR IMPROVING ACCESS TO MEMORY BY DEFERRING WRITE OPERATIONS

George F. DeTar, Jr., Westminster, Colo.; Marcus J. Schaefer, Plano, and William R. Busby, Richardson, both of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 6, 1980, Ser. No. 118,940

Int. Cl.³ G06F *5/06*

U.S. Cl. 364—200 **8 Claims**



1. In a computer system, wherein a device on a bus can gain control of the bus and send a write command including an address and a data word of a first number of bits on the bus to be written to a memory which operates with a word of at least twice said first number of bits, the improvement comprising:

means for receiving from said bus a first write command including a first address and data word to be written to said memory;

means for storing said first data word and address;

means for receiving a second write command including a second address and data word to be written to the memory;

means for comparing said received second address with said stored first address and making a determination whether

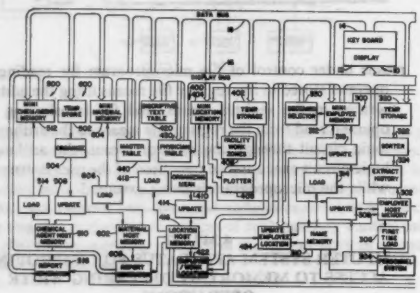
said first and second addreses lie within a single one of said memory words; and

means, responsive to the determination that said first and second addresses lie in said one memory word, for performing a single write of said first and second data words to said one memory word.

4,347,568
OCCUPATIONAL HEALTH/ENVIRONMENTAL SURVEILLANCE

Edward L. Giguere, Parma; Paul H. Kaiser, North Olmsted; Gordon M. Campbell, North Ridgeville, all of Ohio; Peter F. Hoffman, O'Fallon, Ill., and Hansford Boutchyard, Jr., Brunswick, Ohio, assignors to Diamond Shamrock Corporation, Wilmington, Del.

Filed Dec. 7, 1978, Ser. No. 967,520
Int. Cl.³ G06F 7/00
U.S. Cl. 364—300 **26 Claims**



1. A method of manipulating data concerning the health of a plurality of employees in a computer system, each of the employees working in at least one work location, each of the employees being identifiable by an employee identification and each of the work locations being identifiable by a work location identification, substances of which at least some are potentially hazardous being or having been present in at least one of the work locations, each of the substances being identifiable by a substance identification, the computer system having a substance data base for storing substance identifications, an employee identification data base for storing employee identifications, and an employee health data base for storing employee health data concerning each of the identified employees, said method comprising:

storing in the employee identification data base an identification of each employee and in conjunction with each stored employee identification storing a work location identification for each work location at which the employee has worked and in conjunction with each stored location identification storing an identification of the date the employee has worked at that work location;

updating the employee identification data base with the steps of entering new employee identifications when new employees are hired; entering additional work location identifications and date identifications in conjunction with each stored employee identification when the identified employee changes work locations;

storing in the substance data base substance identifications of substances which are or have been used and in conjunction with each substance identification storing the work location identification of each work location at which the substance has been present and in conjunction with each work location identification an identification of the dates the substance was present at that work location;

updating the substance data base including the steps of: entering additional substance identifications when additional substances are used and entering additional work location identifications and date identifications in conjunction with each stored substance identification when the use of that substance is commensed or discontinued at the identified work location;

storing in the employee health data base the employee identification of each employee and in conjunction with each employee identification, health data concerning the employee identified; and

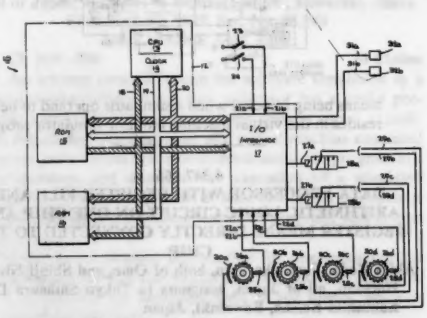
updating the employee health data base including the steps of: entering additional employee identifications of new employees; entering additional health data in conjunction with each stored employee identification as new health data is acquired concerning the identified employee;

whereby data is stored in interrelated data bases for relatively easy retrieval of data concerning employees, substances, work locations, employee health, and combinations thereof.

4,347,569
WHEEL SLIP SYSTEM

John J. Allen, Jr., Watertown, and Bruce W. Shute, Henderson Harbor, both of N.Y., assignors to General Signal Corporation, Stamford, Conn.

Filed Aug. 12, 1980, Ser. No. 177,347
Int. Cl.³ G06F 15/20; G01P 3/48
U.S. Cl. 364—426 **18 Claims**



1. A method for detecting wheelslip on a railway car comprising the steps of:

initially measuring the speed of each of a plurality of wheels while the car is coasting;

determining valid initial measured speeds;

normalizing the valid initial measured speeds in order to derive a normalizing factor for each wheel;

subsequently measuring the speed of each wheel from which a valid initial measured speed was determined;

applying the normalizing factor of each wheel to the corresponding subsequently measured speeds;

comparing the normalized subsequent speed measurements of the wheels to each other and to previous corresponding normalized speed measurements for each wheel;

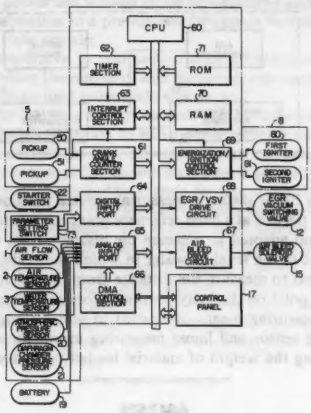
indicating when the compared normalized speeds between wheels differ from each other by more than a first predetermined amount thereby showing that a wheel is slipping and when the compared normalized speeds for each wheel differ by more than a second predetermined amount thereby showing that the wheels are slipping.

4,347,570

METHOD AND APPARATUS FOR CONTROLLING IGNITION COIL ENERGIZATION

Susumu Akiyama, Kariya; Kenzo Ito, Okazaki; Hiroyasu Fukaya, Nagoya; Haruhiko Ogiso, Kariya; Yuji Hirabayashi, Aichi, and Takahide Kawamura, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyoto, both of, Japan

Filed Dec. 14, 1979, Ser. No. 103,942
Claims priority, application Japan, Dec. 18, 1978, 53-157782
Int. Cl.³ F02P 5/08, 3/02; F02B 5/02
U.S. Cl. 364—431.04 5 Claims



4. An apparatus for controlling an internal combustion engine having an output shaft rotated by the combustion of air-fuel mixture ignited by a spark voltage generated by an ignition coil, said apparatus comprising:

sensor means sensing operating conditions of said engine and developing sensor binary signals indicative of said sensed operating conditions;

memory means memorizing a predetermined control program;

processor means responsive to said sensor means and said memory means for developing a first and second binary signals indicative of coil energization and deenergization instants defining rotational positions of said output shaft, respectively, by:

repeatedly calculating said coil deenergization instant by using said sensor binary signals,

discriminating whether said ignition coil has been commanded to be under energized condition or not,

determining, when said discrimination result is positive, an optimum coil deenergization instant, and

generating said second binary signal in response to said optimal coil deenergization instant; and

igniter means connected to said processor means and said ignition coil for energizing and deenergizing said ignition coil at the rotational positions defined by said first and second binary signals.

4,347,571

INTEGRATED CLOSED LOOP ENGINE CONTROL

Chun-Keung Leung, Farmington, and William R. Seitz, Royal Oak, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 904,138, May 8, 1978. This application Sep. 15, 1980, Ser. No. 187,393
Int. Cl.³ F02B 3/08; F02D 5/02; F02M 51/00
U.S. Cl. 364—431.08 35 Claims

34. A fuel management control for an internal combustion engine having at least one combustion chamber wherein a combustible mixture is burned to generate a force which is applied to a movable member therein, comprising:

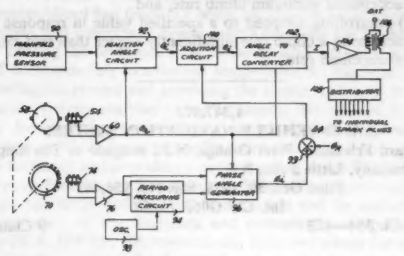
means for generating a reference signal indicative of at least one predetermined position of the movable member;

means for detecting the motion of the member and for generating velocity profile signals indicative of the substantially instantaneous velocity of the member in relation to said reference signal;

means for generating desired velocity profile signals indicative of the desired velocity profile of the movable member;

means responsive to said velocity profile signal for generating a correction signal indicative of the magnitude of the difference of at least two different deviations of said velocity profile signals; and

combustible fuel mixture control means responsive to at least one other operational parameter of the engine and said correction signal to control the amount of combustible mixture delivered to the chamber to minimize the magnitude of the difference in the velocity profile signals from the desired velocity profile signals.



35. A method for controlling the operation of an internal combustion engine having at least one combustion chamber wherein a combustible mixture is burned to generate a force applied to a movable member thereof, the method comprising:

generating a reference signal indicative of at least one predetermined position of the movable member;

detecting the motion of the movable member for generating elocity profile signal indicative of the instantaneous velocity of the member in relation to said reference signal;

generating desired velocity profile signals indicative of the desired operation of the internal combustion engine;

generating a correction signal indicative of the magnitude of the difference of at least two deviations of the velocity profile signals from said desired velocity profile signal;

generating a parameter signal indicative of at least one other operational parameter of the engine; and

combining said parameter and correction signals to generate control signals controlling the combustion of the combustible mixture delivered to the chamber to minimize the magnitude of the difference between the velocity profile signals and the desired velocity profile signals.

4,347,572

METHOD AND APPARATUS FOR AN AIRCRAFT CLIMB-OUT GUIDANCE SYSTEM

James W. Berwick, Jr., Seattle; Robert J. Bleeg, Mercer Island, and Vincent E. McFaddin, Renton, all of Wash., assignors to The Boeing Company, Seattle, Wash.

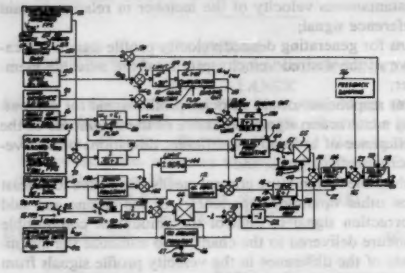
Filed Nov. 2, 1979, Ser. No. 90,812
Int. Cl.³ G06F 15/50; G06G 7/78
U.S. Cl. 364—433 12 Claims

1. A method for determining the climb-out guidance of an aircraft comprising the descending priority steps of:

(a) performing controls (b) through (d) below but under no

circumstances allowing aircraft angle of attack to exceed a predetermined stick shaker value;

(b) controlling vertical speed to achieve a predetermined acceptable, minimum climb rate regardless of airspeed loss;



(c) commanding both increased vertical speed and airspeed control in response to excess thrust upon exceeding said acceptable minimum climb rate; and

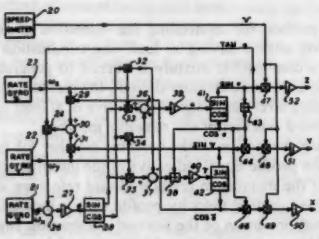
(d) controlling airspeed to a specified value in response to achieving a climb rate significantly higher than said minimum climb rate.

4,347,573

LAND-VEHICLE NAVIGATION SYSTEM

Bernard Friedland, West Orange, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Oct. 30, 1978, Ser. No. 956,459
Int. Cl.³ G06F *15/50*
U.S. Cl. 364—453 **9 Claims**



1. A land vehicle navigation system comprising:

means for providing a signal indicative of the speed of the vehicle,

means strapped down to said vehicle along three orthogonal axes for generating angular rate signals along said axes, and

means for combining said signal indicative of the speed of said vehicle and said orthogonal rate signals for determining the position of said vehicle along said three axes.

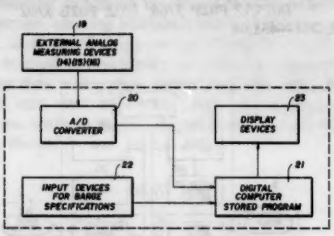
4,347,574

METHOD OF AND APPARATUS FOR DETERMINING WITH PRECISION THE PAYLOAD OF A WATER BORNE VESSEL

Ward H. Parsons, 1202 Green Glen Rd., Birmingham, Ala. 35216

Continuation-in-part of Ser. No. 950,472, Oct. 11, 1978, abandoned. This application Jul. 7, 1980, Ser. No. 166,362
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—463 **2 Claims**

1. In a weighing system for water borne vessels to enable an accurate determination of the weight of material loaded on a vessel, a floating vessel body portion adapted to receive material from a loading means, a list angle sensor fixed on said body portion and operable to measure the list angle of the vessel before and after loading with material and to provide list angle indications proportional to the degree of list before and after loading, a trim angle sensor fixed on said body portion and operable to measure the trim angle of the vessel before and after loading with material and to provide trim angle indications proportional to the degree of trim before and after load-



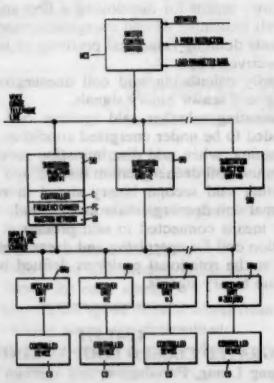
ing, and a linear distance measuring device positioned above said body portion at a fixed reference point relative to the body portion and adapted to measure the distance from said reference point to the level of water in which the body portion is floating and to measure the distance from the reference point to a fixed point on the body portion before and after loading a weight measuring means connected to said list angle sensor, trim angle sensor and linear measuring means for accurately determining the weight of material loaded on said vessel.

4,347,575

SYSTEM FOR CONTROLLING POWER DISTRIBUTION TO CUSTOMER LOADS

George P. Gurr, Dunwoody; John N. Davis, Atlanta, and E. Thomas Wiggins, Dunwoody, all of Ga., assignors to Sangamo Weston, Inc., Atlanta, Ga.

Continuation of Ser. No. 53,740, Jul. 2, 1979, abandoned. This application Aug. 8, 1980, Ser. No. 176,553
Int. Cl.³ H04Q *9/00*; H02J *3/10*
U.S. Cl. 364—492 **12 Claims**



1. An electric power system for controlling the distribution of power along power lines from a substation to a plurality of loads, which comprises:

a master control station including first programmable digital data processor means and input/output devices adapted to be controlled for generating master control signals;

at least one substation injection unit located at said substa-

tion in communication with said master control station and adapted for control by second programmable digital data processor means for injecting, in response to certain of said master control signals, pulse code signals onto said power lines; and

a plurality of remote receiver units each adapted to be connected to a particular load device and to said power lines for receiving said pulse code signals, each of said remote receiver units responsive to one of said pulse code signals for connecting or disconnecting its load from said power lines; and

wherein said substation injection unit further comprises:

means for converting the frequency of a standard three-phase power line voltage signal generated by said utility at said substation to a preselected frequency desired for said pulse code signals;

means responsive to said second data processor means for controlling the output of said frequency converting means to generate said pulse code signals; and

means for injecting said pulse code signals onto said power lines for transmission to said remote receiver units; and

wherein said frequency converting means comprises:

three-phase rectifier means including a plurality of conduction controlled solid state devices under the control of said second data processor means for receiving said three-phase power line voltage signal and for developing a DC voltage signal of a predetermined level; and

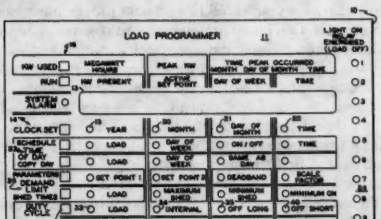
three-phase inverter means including a plurality of conduction controlled solid state devices under the control of said second data processor means for receiving said DC voltage signal from said rectifier means and for converting same to said pulse code signal at said preselected frequency.

4,347,576

LOAD MANAGEMENT CONTROL APPARATUS WITH IMPROVED DUTY CYCLE OPERATION

Robert A. Kensinger, Dakota County, and Robert N. Norman, Hennepin County, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 28, 1980, Ser. No. 144,495
Int. Cl.³ G06F 15/56; H02J 13/00
U.S. Cl. 364—493 **11 Claims**



1. In a load management control apparatus comprising,

a plurality of switch means adapted to control individual loads for individual duty cycles of a predetermined off time for each operating time interval,

means connected to said switch means for programming the operation of said switch means to select a percentage off time and an operating time interval for certain of said switch means and thus its load,

means connected to said means for programming for determining the total percentage of off time of all the loads which are being duty cycled and rounding this number off to the closest whole number, and

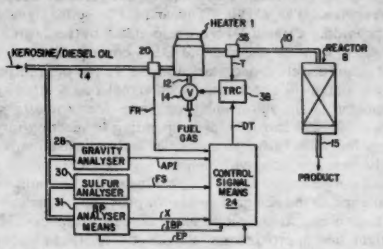
control means connected to said means for programming for always maintaining the number of loads off the same as said whole number.

4,347,577

FEEDSTOCK TEMPERATURE CONTROL SYSTEM

Charles A. Ganster, Houston, and Gerald V. Nelson, Nederland, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 15, 1980, Ser. No. 216,723
Int. Cl.³ C01G 21/00; G06G 7/58
U.S. Cl. 364—501 **10 Claims**



1. A control system for controlling the temperature of kerosine/diesel fuel feedstock being fed to a reactor in a hydrotreating unit comprising heater means receiving the feedstock for heating the feedstock in accordance with a control signal DT corresponding to a desired temperature for the feedstock entering the reactor and providing the heated feedstock to the reactor, gravity analyzer means for sensing the API gravity of the feedstock and providing a signal API corresponding thereto, sulfur analyzer means for sensing the sulfur content of the feedstock and providing a corresponding signal FS, boiling point analyzer means for sensing the 50% boiling point temperature, the initial boiling point temperature and the end point temperature of the feedstock and providing corresponding signals X, IBP and EP, respectively, flow rate means for sensing the flow rate of the feedstock and providing a signal FR representative thereof, and control signal means connected to the heater means, to the gravity analyzer means, to the sulfur analyzer means, to the boiling point analyzer means and to the flow rate means for providing control signal DT in accordance with signals API, FS, X, IBP, EP and FR, said control signal means includes means connected to the boiling point analyzer means and to the gravity analyzer means for providing a signal MW corresponding to the molecular weight of the feedstock in accordance with signals X and API, SF computer means connected to the boiling point analyzer means for providing a signal SF corresponding to a sulfur factor of the gas oil which is at the estimated distillation temperature at which half of the sulfur in the feedstock is distilled overhead, in accordance with signal X and

$$SF = C9 - C10e^{-C11(X)} \quad \text{1a.}$$

when the value for X is less than 450° F., and

$$SF = C9 - C10(X) + C11(X^2) \quad \text{1b.}$$

when the value for X is equal to or greater than 450° F., where C9, C10 and C11 are constants having one set of values for equation 1a and another set of values for equation 1b, subtracting means connected to the boiling point analyzer means for subtracting signal IBP from signal EP to provide signal R corresponding to the temperature range of the kerosine/diesel fuel, ALHSV signal means connected to the flow rate means and receiving a direct current voltage CAT.VOL. corresponding to the catalyst volume of the reactor in barrels for providing a signal ALHSV corresponding to the actual liquid hourly space velocity of the kerosine/diesel fuel in accordance with signal FR and the voltage CAT VOL, A signal means connected to the MW computer means, to the SF computer means, to the subtracting means, to the sulfur analyzer means and to the gravity analyzer means for providing a signal A corresponding to a feedstock correlating parameter in accor-

dance with signals MW, SF, R, FS and AP', CT computer means connected to the A signal means for providing signals CT95, CT90, CT80 and CT70, corresponding to the correction temperature for 95%, 90%, 80% and 70% desulfurization, respectively, RT signal means connected to the CT signal means for providing signals RT95, RT90, RT80 and RT70 corresponding to the reciprocal temperatures for 95%, 90%, 80% and 70% desulfurization, respectively, in accordance with signals CT95, CT90, CT80, and CT70, sulfur signal means for providing a signal DPS corresponding to the desired product sulfur content and a signal DDS corresponding to a percent desulfurization necessary to achieve the desired product sulfur content in accordance with signal FS, K signal means connected to the sulfur analyzer means for providing signals K95, K90, K80 and K70, corresponding to reaction rate constants for 95%, 90%, 80% and 70% desulfurization, respectively, in accordance with signal FS, slope and intercept signal means connected to the RT signal means, to the sulfur signal means and to the K signal means for providing signals m and b corresponding to the slope and intercept, respectively, of a straight line approximating the kinetic relationship between the reaction rate constant and the reciprocal temperatures in accordance with signals DDS, RT95, RT90, RT80, RT70, K95, K90, K80 and K70, Z signal means connected to the ALHSV signal means, to the sulfur analyzer means and to the sulfur signal means for providing a signal Z corresponding to a reaction rate constant for the desired product sulfur content in accordance with signals ALHSV, FS and DPS, and temperature signal means connected to the slope and intercept signal means and to the Z signal means for providing signal DT in accordance with signals m, b, and Z.

4,347,578

INDUSTRIAL ROBOT CONTROL SYSTEM

Hajimu Inaba, Hino, Japan, assignor to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Apr. 13, 1979, Ser. No. 29,851
Claims priority, application Japan, Apr. 26, 1978, 53-049413
Int. Cl.³ G06F *15/46*; G05B *19/42*
U.S. Cl. 364—513 **21 Claims**

19. A method for controlling an industrial robot in a machine tool and workpiece exchange system comprising the steps of:

(a) entering and storing teach data for operation of the robot in teach memory means in a program having specified codes for automatically modifying the stored teach data or sequence of the programmed teach data in accordance with data corresponding to the program codes read from work memory means;

(b) entering and coding data of the current position of the robot and external data relating to machine work identity, insufficient machine work, and abnormality detection in data entry and coding means;

(c) storing the coded data of the current position of the robot and coded external data in the work memory means;

(d) processing by processor means the coded program from the teach memory means to read the teach data and modify the teach data or sequence of the programmed teach data in accordance with coded data read from the work memory means; and

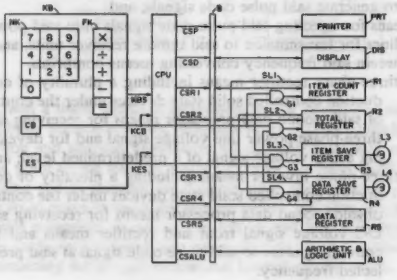
(e) automatically controlling the operation of the robot in accordance with the processed teach and external data program.

4,347,579

ELECTRONIC INSTRUMENT HAVING AN OPERATION COUNT FUNCTION

Shigeru Matsuyama, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 28, 1980, Ser. No. 125,579
Claims priority, application Japan, Mar. 3, 1979, 54-24051
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—709 **9 Claims**



1. An electronic instrument having an operation count function, comprising:

data input means for entering data into said instrument to be operated on;

operation instructing means for generating processing instruction signals;

data processing means connected to said data input means and said operation instructing means and responsive to a processing instruction signal generated by said operation instructing means for processing the data entered by said data input means to obtain a result;

first storage means connected to said data processing means and said operation instructing means and responsive to the result obtained by said data processing means and each processing instruction signal generated by said operation instructing means for storing the result and the number of times a processing instruction signal has been generated;

second storage means for storing the result and the number of times a processing instruction signal has been generated stored in said first storing means;

data transmission means connected between said first storage means and said second storage means to transmit data therebetween;

first instruction control key means connected to said data transmission means for controlling said data transmission means to transmit the same data as that stored in said first storage means to said second storage means for storage therein, said first instruction control key means being operable in the event of an interruption of a series of operations by said data processing means each initiated by each said processing signal, wherein operation of said first instruction control key means causes said first and said second storage means to store the same data; and

second instruction control key means connected to said data transmission means for controlling said data transmission means to transmit the data stored in said second storage means to said first storage means for storage therein, said second instruction control key means being operable in order to resume the interrupted series of operations, whereby if the data stored in said first storage means is

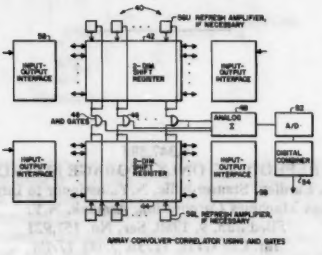
destroyed during the period of interruption, the operation of said second instruction control key means will restore said data to said first storage means from said second storage means.

4,347,580

ARRAY CONVOLVER/CORRELATOR

James W. Bond, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 21, 1980, Ser. No. 170,492
Int. Cl.[3] G06G 7/19; G06F 15/34
U.S. Cl. 364—824 12 Claims



ARRAY CONVOLVER-CORRELATOR USING AND GATES

1. An array convolver-correlator comprising:

first and second two-dimensional shift registers defined by N rows and M columns, the columns of the two registers being aligned, N and M being in the range of 4 to 512, data capable of entering at least one of the left or right columns of each of the two shift registers, the data shifting downward to the bottom row in the first, upper, shift register and upward to the top row in the second, lower, shift register;

a plurality of M means for multiplying, comprising M gating means, each having an input from the bottom row of the upper shift register and the top row of the lower shift register of corresponding columns of the two shift registers;

means for summing, having M inputs connected to the M gating means, for summing the input signals in an analog manner;

means, whose input is connected to the output of the summing means, for converting the analog input signal into a digital signal; and

a means for combining, whose input is connected to the output of the A-to-D converting means, for accumulating shifted outputs of the A-to-D converting means by addition and subtraction.

4,347,581

INPUT SETTING METHOD FOR DIGITAL OPERATIONAL DEVICES

Mitsuru Yamaura; Ryotaro Kondow, both of Fuchu; Megumu Mitani, Tama, and Yoshiji Nii, Kawaguchi, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

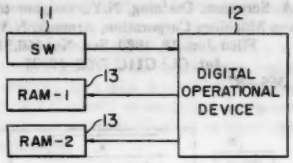
Filed Sep. 24, 1979, Ser. No. 78,511
Int. Cl.[3] G06F 7/04
U.S. Cl. 364—900 4 Claims

1. An input setting method for a protective relaying apparatus for an electric power system, said relaying apparatus including an input setting switch for digitally setting data required for a protective relaying operation of said relaying apparatus, a digital operational device connected to receive said data for periodically executing said relaying operation, and a memory device for storing said data, said method comprising the steps of:

setting said data by utilizing said input setting switch;

storing the data set by said input setting switch in said memory device;

comparing the data set by said input setting switch with the data stored in said memory device during time intervals between periodic executions of said relaying operation;



carrying out said relaying operation utilizing said data when the compared data are found equal; and,

issuing an alarm signal when the compared data are found to be unequal.

4,347,582

CENTRAL TIMER UNIT FOR BUFFERING CONTROL DATA IN A TELECOMMUNICATIONS SYSTEM

Reinhard Frank, Munich, Fed. Rep. of Germany, assignor to Siemens Corporation, Iselin, N.J.

Filed Apr. 23, 1980, Ser. No. 143,159
Int. Cl.[3] G06F 13/06; H04M 15/00, 3/00
U.S. Cl. 364—900 10 Claims

1. A central timer unit of a telecommunication system for buffering pieces of control information received in random order and to be sent out after individual delay times associated with each respective piece of information, said timer unit comprising in combination:

(a) a random access memory having storage cells, each storage cell designed for storing data of

(1) a piece of control information and

(2) a chain address of another storage cell containing another piece of control information to be read out at the same time;

(b) a plurality of time control units each including:

a series of storage units designed for storing a random access memory address; and

read selector means for interrogating the associated series of storage units sequentially and repeatedly in accordance with an individually established operating rate;

said time control units being arranged to form a multi-level hierarchy of clock units each representing by the state of its respective read selector means a digit of a current internal time value;

(c) write selector means commonly assigned to the time control units for randomly selecting a storge unit by means of the most significant non-zero digit of the individual delay time value of a respective piece of control information and for storing therein the address of the storage cell selected for buffering the respective piece of control information; and

(d) a control device having:

an input buffer for temporarily storing incoming pieces of control information;

an output device for transmitting outgoing pieces of control information; and

control means for transmitting address data and data of a piece of control information from said input buffer to the write selector means and said random access memory, between said time control units and said random access memory, and from said random access memory to said output device;

wherein the random access memory address of each piece of control information is handed down to the neighboring lower level time control unit of the hierarchy whenever at a respective digit of the internal storage time value the associated

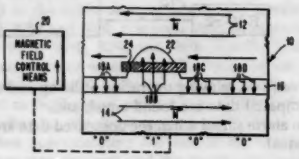
storage unit is selected said random access memory address is read out.

4,347,583

NEEL WALL SEGMENT DETECTION IN CROSS-TIE MEMORY SYSTEMS

Robert A. Scranton, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 18, 1980, Ser. No. 160,511
Int. Cl.³ G11C 7/00, 19/08
U.S. Cl. 365—87 5 Claims



4. A device for detecting the polarity of a Neel wall segment in a cross-tie memory system in a garnet film four-fold in-plane anisotropy comprising:

means for applying a magnetic field in a first direction to a Neel wall segment to expand a segment having a polarity in said first direction into a transverse domain, and

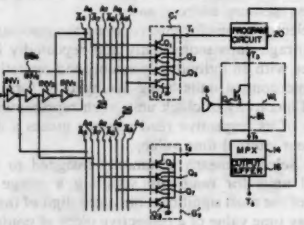
sensing means for detecting the presence or absence of said transverse domain.

4,347,584

PROGRAMMABLE READ-ONLY MEMORY DEVICE

Toshitaka Fukushima, Yokohama; Kazumi Koyama, Ikoma; Kouji Ueno, Kawasaki; Yuichi Kawabata, Yokohama, and Tamio Miyamura, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 21, 1980, Ser. No. 141,934
Claims priority, application Japan, Apr. 23, 1979, 54-50036
Int. Cl.³ G11C 7/00
U.S. Cl. 365—104 9 Claims



1. A bipolar PROM device having a plurality of memory cells which are located at respective cross positions of a plurality of word lines and a plurality of bit lines and which are selected by word address signals and bit address signals applied to said PROM device, said PROM device comprising:

a word address buffer for amplifying said word address signals;

a word address decoder for decoding the word address signals from said word address buffer;

one or more bit address buffers for amplifying said bit address signals;

a first bit address decoder for decoding the bit address signals from said bit address buffer for writing-in of information;

a second bit address decoder for decoding the bit address signals from said one or more bit address buffers for reading-out of information, at least one of said first and second bit address decoders being composed of a plurality of AND gates, each of said AND gates comprising an output terminal and a plurality of PNP type transistors each comprising an emitter, a base, and a collector, to each said base of said transistors being applied the address signals from said bit address buffer, each said collector of said transistors being connected commonly to ground, and each said emitter of said transistor being connected commonly to said output terminal of said AND gate;

a program circuit for initially writing-in information to the selected memory cells; and

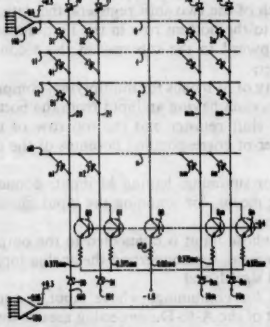
a multiplexer for reading-out information from the selected memory cells.

4,347,585

REPRODUCE ONLY STORAGE MATRIX

David B. Eardley, Stanfordville, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 9, 1980, Ser. No. 157,921
Int. Cl.³ G11C 11/36, 7/00, 17/06
U.S. Cl. 365—105 10 Claims



1. A reproduce only storage matrix comprising:

rows and columns of conductors,

a relatively high barrier Schottky diode device connecting a respective row conductor to a respective column conductor at each matrix crossover at which a stored binary number of a given value is desired,

a multiple of relatively low barrier Schottky diode devices, each of said low barrier diode devices being connected to a respective column conductor for selecting said column, each said low barrier diode device being rendered conductive only when its respective column is unselected, and

a multiple of current sinks,

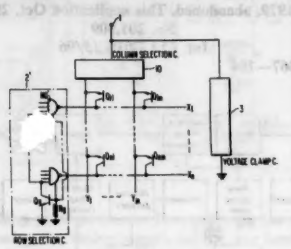
each of said current sinks being connected to a respective column conductor,

the current in each current sink flowing through a respective one of said high barrier diode devices, if present, only if the associated column conductor is selected, said current flowing through said one of said low barrier diode devices when the associated column conductor is unselected.

4,347,586
SEMICONDUCTOR MEMORY DEVICE

Yoshinobu Natsui, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1980, Ser. No. 157,736
Claims priority, application Japan, Jun. 7, 1979, 54-71409
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—174 16 Claims

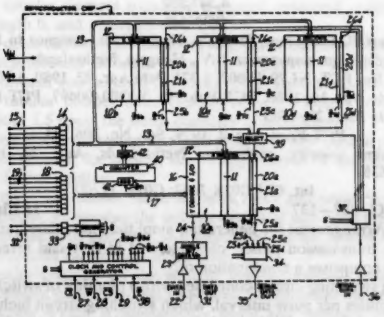


1. A semiconductor memory device comprising a plurality of column lines, a plurality of row lines intersecting said column lines, a plurality of programmable memory cells disposed at the intersections of said column lines and said row lines, a write terminal connectable to a write current source, the state of each of said memory cells being changed by supplying thereto an electric current larger than a predetermined value, a column selection circuit for selectively providing a first current path between a selected one of said column lines and said write terminal, a row selection circuit for selectively providing a second current path between a selected one of said row lines and a reference voltage source different from said write current source, and a current limiter circuit associated with one of said first and second current paths for limiting the amount of write current supplied to a selected memory cell designated by the selected column line and the selected row line within a regulated amount larger than said predetermined value.

4,347,587
SEMICONDUCTOR INTEGRATED CIRCUIT MEMORY DEVICE WITH BOTH SERIAL AND RANDOM ACCESS ARRAYS

G. R. Mohan Rao, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 23, 1979, Ser. No. 97,104
Int. Cl.³ G11C *7/00*
U.S. Cl. 365—189 10 Claims

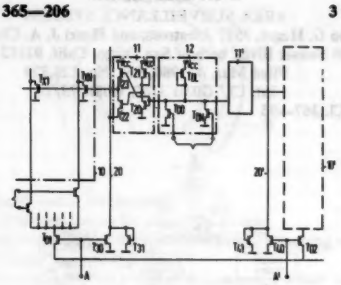


1. A memory device comprising a body of single crystal semiconductor material, a random-access read/write array formed in one face of said body, a serial-access read/write memory also formed in said one face, first addressing means for receiving and decoding a row address for selecting a row in both said memory array and said memory, second addressing means for receiving and decoding a column address for selecting a column in said random access memory array, third addressing means for receiving an address selecting between the random-access memory array or said serial-access memory, each said memory array and said memory having a serial access register, means to selectively clock the serial access registers of said memory array and said memory means, for connecting a data output from the serial access register of the serial-access memory to a data input of the random access memory array, and single-bit input/output access means coupling said random-access memory array to input/output connections for said body.

4,347,588
MOS-INTEGRATED CIRCUIT ARRANGEMENT FOR SUPPRESSING QUIESCENT CURRENTS FLOWING IN WORD LINE DRIVERS OF SEMICONDUCTOR MEMORIES

Kurt Hoffmann, Taufkirchen, and Karl J. Zapf, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 17, 1979, Ser. No. 104,579
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1978, 2855744
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—206 3 Claims



1. MOS integrated circuit arrangement for suppressing quiescent currents flowing in word line drivers of semiconductor memories, comprising bit lines, word lines connected to the word line drivers, and respective controlled switch means addressed by a storage activation signal for suppressing residual currents in the word line drivers, said controlled switch means being connected between the output circuit of the word line drivers and reference potential.

4,347,589
REFRESH COUNTER TEST

Robert J. Proebsting, Dallas, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Continuation of Ser. No. 39,248, May 15, 1979, abandoned. This application Feb. 17, 1981, Ser. No. 235,180
Int. Cl.³ G11C *13/00*
U.S. Cl. 365—222 6 Claims

1. In a memory having a refresh counter, row clock generator and column clock generator, a method for testing the operation of the refresh counter comprising:

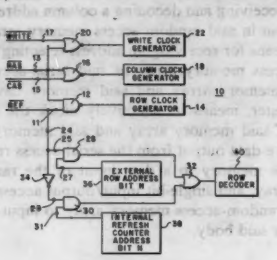
writing a preselected background into the memory;

enabling the row clock generator with a refresh signal;

selecting a row determined by the refresh counter;

enabling the column clock generator;

writing in the memory in the row selected by the refresh counter; and



reading the memory to determine correct operation of the refresh counter.

4,347,590

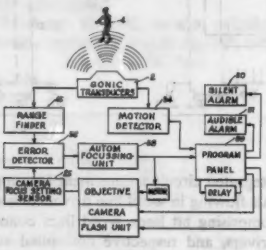
AREA SURVEILLANCE SYSTEM

Vernon G. Heger, 3517 Albatross, and Henri J. A. Charmasson, 2030 Sunset Blvd., both of San Diego, Calif. 92103

Filed Mar. 3, 1980, Ser. No. 126,579

Int. Cl.³ G03B *3/00*; G08B *13/16*

U.S. Cl. 367—93 **2 Claims**



1. An automatic focusing assembly for adjusting the objective of a camera in response to the movement of a body within the camera field of vision which comprises:

means for periodically emitting an ultrasonic signal over an area within said field of vision;

means for detecting the echo of said ultrasonic signal reverberating from said area;

means for generating a first binary-coded signal proportional to the elapsed time between said ultrasonic signal and the detection of said reverberating echo;

means for generating a second binary-coded signal proportional to the setting of said objective;

means for detecting coincidence between said first and second binary-coded signals;

a first gear coupled to said objective;

a pair of semi-circular gears alternately engaging said first gear;

an uni-directional electrical motor; means for coupling said electrical motor to said pair of semi-circular gears and means, responsive to said means for detecting coincidence for de-energizing said motor.

4,347,591

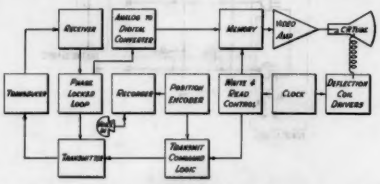
IMAGING SONAR SYSTEM AND METHOD

William F. Stembridge, 3541 Prince George, East Point, Ga. 30044; Roger P. Woodward, 2652 Fleur de Lis Pl., Atlanta, Ga. 30040, and Larry H. Glassman, 5994 Benton Woods Dr. NE., Atlanta, Ga. 30042

Continuation of Ser. No. 581,037, May 27, 1975, abandoned, Ser. No. 800,803, May 26, 1977, abandoned, and Ser. No. 74,862, Sep. 12, 1979, abandoned. This application Oct. 29, 1980, Ser. No. 201,909

Int. Cl.³ G01S *15/96*

U.S. Cl. 367—104 **34 Claims**



1. An imaging sonar system comprising:

(A) a transmitter and receiver;

(B) rotatable transducer means coupled with said transmitter and receiver for generating sound waves and for detecting echoes therefrom;

(C) drive means for rotating said rotatable transducer means;

(D) transducer position sensing means for sensing the rotary position of said rotatable transducer means;

(E) analog to digital converter means coupled with said receiver for converting receiver emitted signals into digital form;

(F) digital memory means for storing receiver emitted signals as digital data;

(G) write and read control means for respectively entering digital data into and recalling digital data from said memory means;

(H) a cathode ray tube coupled with said memory means and having beam deflector means synchronized with said memory read control means for displaying data recalled from said memory means as an image of echoes detected by said transducer means; and

(I) transmit command logic means coupled with said memory write control means and with said transducer position sensing means for initiating transmit commands to said transmitter with the memory write control means synchronized with sensed transducer positions.

4,347,592

SONAR

Huibert B. Langeraar, Hengelo, Netherlands, assignor to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

PCT No. PCT/NL79/00003, § 371 Date Apr. 22, 1980, § 102(e) Date Apr. 14, 1980, PCT Pub. No. WO80/00497, PCT Pub. Date Mar. 20, 1980

PCT Filed Aug. 2, 1979, Ser. No. 206,193

Claims priority, application Netherlands, Aug. 22, 1978, 7808635

Int. Cl.³ G01S *7/52*; G01K *11/00*

U.S. Cl. 367—137 **11 Claims**

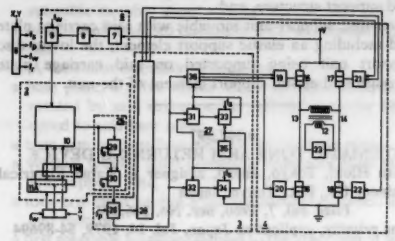
1. Arrangement for generating amplitude-modulated, ultrasonic transmission pulses, characterised in that said arrangement comprises a combination of:

a. a switching circuit controlled with a plurality of switching pulses per pulse interval, which switching circuit includes an inductive load circuit for generating the transmission pulses;

b. a unit for generating timing signals determining the switching pulse frequency;

c. a memory, of which the memory locations are filled with

the information, required per transmission pulse interval, about the pulse width of the switching pulses to be generated, which information is derived from the desired amplitude pattern of the transmission pulses to be generated;



d. a switching-pulse generator for producing the switching pulses, using the timing signals on the one hand and the pulse width information in the memory on the other hand;

e. an address generator for generating addresses on the supply of the timing signals to read out the memory.

4,347,593

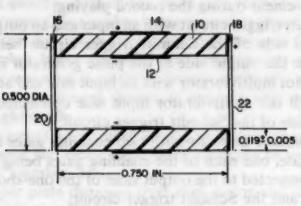
PIEZOCERAMIC TUBULAR ELEMENT WITH ZERO END DISPLACEMENT

W. James Trott, Annandale, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 7, 1979, Ser. No. 101,362

Int. Cl.³ H04R *17/00*

U.S. Cl. 367—159 **4 Claims**



1. A piezoelectric hydrophone having omnidirectional sensitivity over a wide frequency range comprising:

a tubular element of piezoceramic material having thickness t and outside radius a;

said tubular element including a central polarized section of length h, and polarized end sections;

said central polarized sections being polarized in a direction perpendicular different from that of said end sections and with said end sections polarized in the same direction;

said tubular piezoceramic element having a length which is about 1.5 times the outer diameter of the element;

central electrode means, disposed relative to said central polarized section, for sensing the voltage output of said central polarized section;

end electrode means, disposed relative to said polarized end sections, for sensing the voltage output of said polarized end sections, said end and said central electrode means being connected electrically in parallel:

whereby pressure on the ends of the end sections causes a voltage output from said central electrode means the central section which is substantially equal and opposite to the voltage output from the said end electrode means sections whereby the vector sum of these voltages obtained via the parallel connection of said electrode means is zero and the ends are insensitive to pressure thereon.

4,347,594

WORLD WATCH

Pierre Tschanz, Neuwis 25, Küsnacht, Switzerland

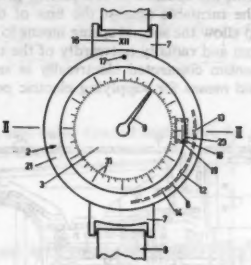
PCT No. PCT/CH79/00073, § 371 Date Jan. 23, 1980, § 102(e) Date Jan. 7, 1980, PCT Pub. No. WO79/01104, PCT Pub. Date Dec. 13, 1979

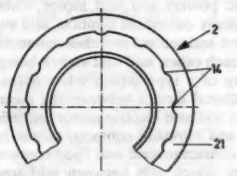
PCT Filed May 22, 1979, Ser. No. 192,522

Claims priority, application Switzerland, May 23, 1978, 5618/78

Int. Cl.³ G04B *19/22*

U.S. Cl. 368—21 **4 Claims**





1. A world watch comprising:

a pair of spaced means for attaching straps;

a locking ring disposed between said pair of attaching means and fixedly secured thereto;

a watch case including a watch movement, a watch face, a watch hand driven by said watch movement for indication of time and a bezel disposed about said watch face and fixedly secured to said case, said watch case rotatable secured to said locking ring;

means for locking said watch case in a selected one of a plurality of rotational positions with respect to said locking ring, the length of the arc between each adjacent pair of said rotational positions corresponding to a time difference of one hour;

a reference numeral disposed on one of said attaching means; and

a reference mark disposed on said bezel, the number of rotational positions between the location of said reference numeral and the location of said reference mark indicating the time difference in hours between two selected time zones.

4,347,595

RECORD PLAYER

Mun-Hay Ngai, 130-132 Argyle St., 3/fl. Flat C., Kowloon, Hong Kong

Filed Jun. 23, 1980, Ser. No. 161,700

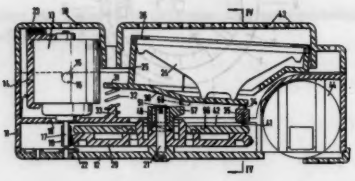
Claims priority, application United Kingdom, Jan. 22, 1980, 8002091; Apr. 1, 1980, 8010959

Int. Cl.³ A63H *3/33*; G11B *17/06*

U.S. Cl. 369—67 **12 Claims**

1. A record player suitable for a toy and comprising a con-

tainer, means for supplying electric power, an electric motor, a turntable mounted in the container and rotatable by said electric motor, a speaker movable about a pivot towards the turntable under the bias of first spring means, a tone arm having a stylus and being movable with the speaker towards the turntable against the bias of second spring means so as to engage a record in use on the turntable, the second spring means biasing the tone arm radially outwardly of the turntable, reset means mounted on the turntable and engageable with the speaker or a part connected thereto as the tone arm moves towards the centre of the turntable, said reset means being operable on engagment with the speaker or the part to pivot the speaker away from the turntable against the bias of the first spring means so as to allow the second spring means to move the tone arm away from and radially outwardly of the turntable and a switch mechanism connected electrically in series with said motor and said means for supplying electric power for auto-



matically interrupting the circuit between said means for supplying electric powers and said motor when said tone arm reaches its radially outermost position, said switch mechanism comprising first and second switches connected electrically in parallel with each other, said first switch being manually operable and being of a type which when actuated only briefly makes an electrical circuit between the means for supplying electric power and said electric motor and said second switch having fixed and movable contacts, means resiliently urging said movable contact toward said fixed contact and a pivotably mounted lever which acts between said tone arm and said movable contact to move said movable contact away from said fixed contact when said tone arm supports said stylus at or adjacent its radially outermost position so that said fixed and movable contacts are separated when but only when said tone arm supports said stylus at or adjacent its radially outermost position.

4,347,596

DISC PLAYER APPARATUS

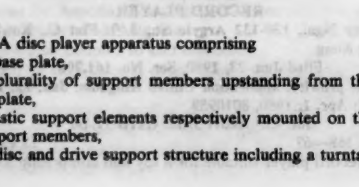
Kunio Abe; Masatsugu Saito; Masao Ono, and Yuji Ikedo, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 9, 1981, Ser. No. 223,617

Claims priority, application Japan, Jan. 11, 1980, 55-1897; Jan. 11, 1980, 55-1899; Jan. 11, 1980, 55-1901

Int. Cl.³ G11B *1/00, 25/04*

U.S. Cl. 369—72 **17 Claims**



1. A disc player apparatus comprising

a base plate,

a plurality of support members upstanding from the base plate,

elastic support elements respectively mounted on the support members,

a disc and drive support structure including a turntable for holding thereto a disc to be played back, the support structure being supported in weight transmitting relationship on said support members through said elastic support elements,

a carriage plate movable into and out of a position below said support structure, and

a lower disc support unit movable with said carriage plate and including an elastic support element, the lower disc support unit being supported on said carriage plate through said elastic support element of the unit.

4,347,597

AUTOMATIC TONE ARM RETURNING DEVICE

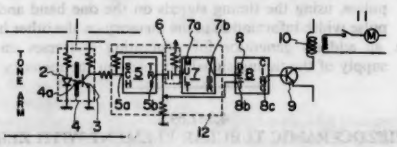
Shunkichi Hioki, Tokyo, Japan, assignor to Katoh Electrical Machinery Co., Ltd., Tokyo, Japan

Filed Jul. 7, 1980, Ser. No. 166,594

Claims priority, application Japan, Jul. 14, 1979, 54-89694

Int. Cl.³ G11B *17/00*

U.S. Cl. 369—231 **4 Claims**



1. In a record player with a tone arm, an automobile tone arm returning device having detecting means for detecting the lead out groove of a record being played by the record player, said tone arm returning device comprising:

(a) pulse generator means with an output side for producing pulses whose cycle corresponds to the speed of the tone arm movement during the record playing;

(b) a Schmitt trigger circuit with an input and an output side, the input side of the Schmitt trigger circuit being connected to the output side of the pulse generator means;

(c) a one-shot multivibrator with an input side and an output side, with the multivibrator input side connected to the output side of the Schmitt trigger circuit;

(d) a comparator detector with two enabling gates and one output gate, one each of the enabling gates being respectively connected to the output sides of the one-shot multivibrator and the Schmitt trigger circuit;

(e) a switching transistor with a relay on the output side of the switching transistor, said switching transistor being operatively connected to the output side of the comparator detectors;

(f) and, a motor operatively connected to the switching transistor through the relay to reset the tone arm, whereby, the position of the tone arm as being in the lead out groove is detected when an enabling signal is present at both enabling gates.

4,347,598

TONE ARM ASSEMBLY

Fumio Arakawa, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 24, 1980, Ser. No. 209,359

Claims priority, application Japan, Nov. 30, 1979, 54-154193

Int. Cl.³ G11B *3/16*

U.S. Cl. 369—254 **11 Claims**

1. A tone arm assembly comprising:

a tone arm shaft having a cartridge assembly mounted on a first end thereof;

a first rotatable member coupled to the other end of said tone arm shaft;

a second rotatable member extending in the vertical direction, said second rotatable member being rotatable about a vertical axis and being mounted upon a base member;

said first rotatable member being rotatably supported by said second rotatable member and said first rotatable member being rotatable about a horizontal axis;

connecting means detachably mounted on said first rotatable member for limiting said rotational movement of said first rotatable member about said horizontal axis; and

a weight shaft coupled integrally with said connecting member.

6. A tone arm assembly comprising:

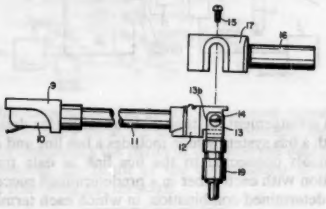
a base plate, a drive motor and a turntable coupled to be rotated by said drive motor, said drive motor being secured to said base plate;

a tone arm support base secured to said base plate;

a vertical tubular shaft extending upwardly from said tone arm support base;

a tone arm shaft having a phonocartridge mounted at a first end thereof;

a first rotatable member coupled to the other end of said tone arm shaft;



a second rotatable member coupled to the upper end of said vertical shaft, said second rotatable member being rotatable about a vertical axis upon said vertical shaft and said first rotatable member being rotatable about a horizontal axis on said second rotatable member, said first rotatable member being provided with stop means wherein said tone arm shaft is rotatable from a horizontal position prior to the attachment thereto of a connecting member and a weight shaft;

said connecting member having apertures on opposite sides thereof and being detachably mounted to said first rotatable member; and

an upper plate disposed over said motor and tone arm support base, said upper plate having separate apertures therein corresponding to the positions of a turntable drive spindle and said vertical shaft and being solid throughout most of the extent of said tone arm shaft and cartridge.

4,347,599

SPINDLE CLAMP ASSEMBLY FOR A VIDEO RECORDER-PLAYBACK MACHINE

George Vitale, Torrance, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Filed Oct. 20, 1980, Ser. No. 198,694
Int. Cl.[3] G11B *25/04, 3/62*
U.S. Cl. 369—270 **37 Claims**

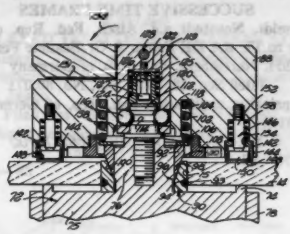
1. A spindle clamp assembly for positioning a disc upon a rotatable drive spindle having a shaft portion for reception through an opening formed in the disc, comprising:

a radially expansible sleeve receivable about the spindle and within the opening formed in the disc;

a collet receivable about the spindle adjacent said sleeve, said sleeve and said collet being configured with respect to each other such that displacement of said collet toward said sleeve causes substantially uniform radial expansion of said sleeve into bearing engagement with the disc for centering the disc with respect to the spindle;

a clamp housing receivable over the spindle and including locking means for locking engagement with the spindle for retaining the disc on the spindle; and

biasing means carried by said housing for engaging said collet when said housing is received over the spindle for



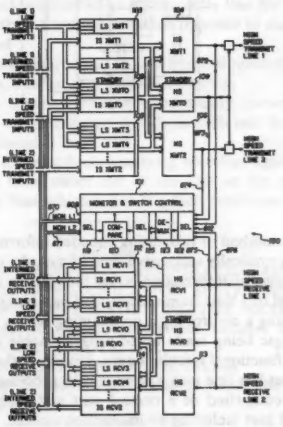
displacing said collet toward said sleeve for radial expansion of said sleeve.

4,347,600

MONITORED MULDEM WITH SELF TEST OF THE MONITOR

Ned E. Abbott, McKinney; Hampapur R. Keshavan, Dallas, and Robert J. McGuire, Richardson, all of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 3, 1980, Ser. No. 156,150
Int. Cl.[3] H04J *3/14*
U.S. Cl. 370—13 **18 Claims**



1. A multiplexer with an improved monitoring system for the detection of malfunctions, comprising in combination:

a plurality of parallel data input groups;

transmission means multiplexing said data input groups for serial transmission of high speed data; and

monitor means testing data paths through said multiplexer for detection of malfunctions in said multiplexer, and including monitor self-test means for detection of malfunctions in said monitor means;

wherein said monitor means has a first input side connected to the inputs to said data input groups and has a second input side connected to the output of said transmission means for monitoring data path failures through said multiplexer by comparing the latter's input and output, and wherein said monitor self-test means comprises error injection means injecting errors at one of said input sides of said monitor means for testing the latter's detection thereof.

4,347,601

METHOD AND SYSTEM FOR PROCESSING CODED INFORMATION TRANSMITTED DURING CYCLICALLY SUCCESSIVE TIME FRAMES

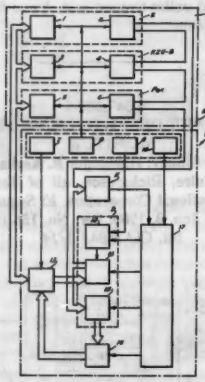
Hans Schmidt, Neustadt a.d. Aisch, Fed. Rep. of Germany, assignor to TE KA DE Felten & Guilleaume Fernmeldeanlagen GmbH, Nuremberg, Fed. Rep. of Germany

Filed Sep. 28, 1979, Ser. No. 80,071

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1978, 2843179

Int. Cl.³ H04Q *11/04;* G06F *13/00*

U.S. Cl. 370—58 7 Claims



1. A method of processing encoded information transmitted during cyclically successive time frames, the method including processing all information in real time during a computing time channel of a time frame subdivided into computing time channels using a control logic cooperating with a storage, the control logic being made up of programmable and permanently wired functional circuits stages, writing in the information via an input bus line into a storage of a processor, the processor being comprised of a central part and peripheral units, the central part including an instruction storage, a data storage, a computing unit, a program-word register, an input multiplexer device and a hardward-control unit; and selecting a particular program from a plurality of programs stored in the programmed functional circuit stages as a function of the significance of the information using the instruction storage to control the write-in of a particular program word from the data storage into the program-word register as a function of the significance of the information; using the program-word storage to in turn call forth one of the programs; in dependence upon the information written into the data storage computing a plurality of predefined and ordered variables in accordance with Boolean algebra; storing in an intermediate storage the program word for the next processing operation, the next processing operation being a processing operation which is to begin at a completely predetermined moment in time within the predetermined time frame; and converting the information into control commands for the peripheral units made available on an output bus line.

4,347,602

CIRCUIT ARRANGEMENT FOR TIME DIVISION MULTIPLEX DATA TRANSMISSION WITH A BUS SYSTEM

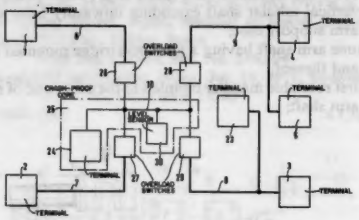
Horst Kister, Wehrheim, and Horst Ullrich, Schöneck, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Fed. Rep. of Germany

Filed May 1, 1979, Ser. No. 35,003

Claims priority, application Fed. Rep. of Germany, May 31, 1978, 2823708; Jul. 7, 1978, 2829839

Int. Cl.³ H04J *3/08*

U.S. Cl. 370—85 9 Claims



1. An arrangement for time division multiplex data transmission with a bus system which includes a bus line and a plurality of terminals connected to the bus line in data transmitting connection with each other in a predetermined succession and in a predetermined combination, in which each terminal has at least one programmable counter having a counting input for connection with a synchronizing signal generator and an output for connection with switching means to produce a data transmitting connection between the bus line and a data source or sink of this terminal, the counters of all terminals being synchronized with each other, means connected in the combination to detect short circuits and to shut down individual sections of the bus line to protect the individual sections without shutting down all sections, and a resistor arranged between the bus line and a terminal to limit short circuits, the resistor having a resistance value which increases as the current increases.

4,347,603

SYSTEM FOR EXCHANGING ENCODED MESSAGES BETWEEN STATIONS

Jean-Baptiste Jacob; Yves Mathieu, both of Perros-Guirec, and Michel Ruvoen, Trebeurden, all of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed May 1, 1980, Ser. No. 145,539

Claims priority, application France, May 4, 1979, 79 11319

Int. Cl.³ H04J *3/08;* H04L *1/16, 1/10*

U.S. Cl. 370—85 9 Claims

1. A system for exchanging encoded messages between stations connected by a signal bus and a data bus, each station being connected to a general timebase and including a connection module connected to the data bus and to the signal bus; wherein the signal bus and data bus are serial multiplex links synchronous with the timebase, a time interval comprising consecutive even-numbered and odd-numbered time slots is allocated in each signalling frame to each connection module, and wherein each connection module comprises:

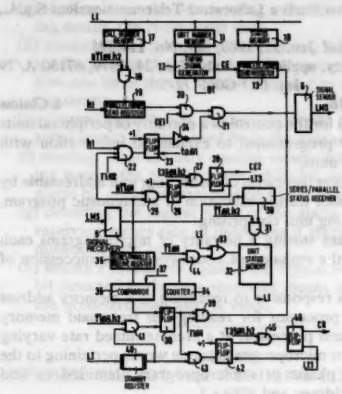
means for calling a station by sending a number relating to the called station in the time interval of said connection module,

means for receiving a response from the called station during said time interval of said connection module and authorizing the sending of a data message,

means for sending a response upon receipt of a number sent from a calling station in said time interval of said connection module,

means for storing a data message and sending said message in a data bus frame,

means for receiving a data message and means for storing the message,



means for computing the parity of the sent message and sending a parity bit at the end of the message, and

means for computing the parity of the received data message and sending the result of the computation in the data frame following the message.

4,347,604

BI-DIRECTIONAL DATA COMMUNICATIONS SYSTEM

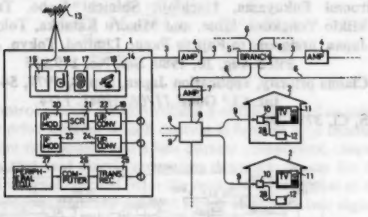
Masaki Saito, and Tetuo Kanazashi, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 5, 1980, Ser. No. 156,532

Claims priority, application Japan, Jun. 8, 1979, 54-72514

Int. Cl.[3] H04J *3/06*

U.S. Cl. 370—85 6 Claims



1. A bi-directional data communications system comprising:

a center facility, said center facility transmitting at predetermined intervals a cycle start frame signal and a plurality of synchronizing frame signals for each start frame signal;

a down-data line connected to said center facility for transmission of first data said start frame signal and said synchronizing frame signal from said center facility to terminal control units and an up-data line connected to said center facility for transmission of second data from said terminal control units to said center facility; and

a plurality of terminal control units coupled to said up-data line and said down-data line, each said terminal control unit comprising a counter, said counter being initialized by said cycle start frame signal received upon said down-data line and said counter counting in response to said synchronizing frame signals received on said down-data line, and means for simultaneously transmitting said second data to said center facility on said up-data line and receiving said first data from said center facility on said down-data line when the count output value from said counter reaches a predetermined value.

4,347,605

MULTIPLEXED TELECOMMUNICATION SYSTEMS

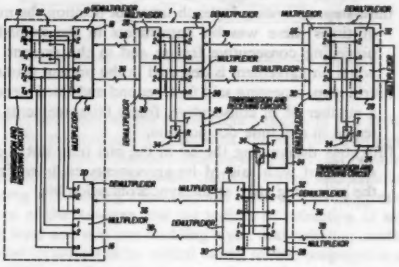
Masao Hashizume, Tokyo, and Akira Kitazawa, Chofu, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 11, 1980, Ser. No. 139,400

Claims priority, application Japan, Apr. 13, 1979, 54-45174

Int. Cl.[3] H04J *3/02*

U.S. Cl. 370—88 7 Claims



7. A multiplexed telecommunication system comprising:

a first looped unidirectional transmission line for transmitting signals in a first direction;

a second looped unidirectional transmission line for transmitting signals in a second direction opposite to said first direction; and

a plurality of stations coupled to said first and second transmission lines, each of said stations including,

first means for simultaneously bi-directionally transmitting multiplexed communication signals on both said first and second transmission lines, and

second means for selectively receiving specified signals for each station from either one of the first or the second transmission lines which is not in a fault condition.

4,347,606

METHOD OF FRAME SYNCHRONIZATION OF A DIGITAL TDM COMMUNICATION SYSTEM AND ARRANGEMENT FOR PERFORMING THE METHOD

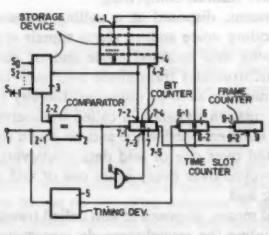
Jacobus Hoogeveen, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 18, 1980, Ser. No. 141,544

Claims priority, application Netherlands, Apr. 26, 1979, 7903284

Int. Cl.[3] H04J *3/06*

U.S. Cl. 370—105 4 Claims



1. A method of frame synchronization of a digital time-division multiplex (TDM) communication system wherein a frame includes a sequence of N consecutive time slots, each slot

containing at least one bit, at least one slot of which comprising at at least one synchronization bit, and wherein M such frames (M>2) comprise a complete synchronization pattern having a numerical order of 0 to M−1, characterized in that the method comprises the following steps:

first step, comparing each incoming bit of a sequence of N consecutive time slots with a bit of the synchronisation pattern, the numerical order of said synchronization pattern bit being initially 0 and subsequently equal to the number of times bit-agreement was detected in respective time slot positions in immediately preceding, consecutive frames;

second step, determining, for each time slot position, whether there is agreement or not;

third step, recording for each time slot position the number of times there was bit agreements in the immediately preceding consecutive frames and in the present frame when bit agreement is detected in the present frame;

fourth step, repeating said first, second and third steps until a number M of consecutive, frame bit-agreements is detected in one time slot position;

fifth step, designating the bit in the one time slot position, associated with said M bit-agreements as determined in the preceding step, as the synchronization bit.

4,347,607

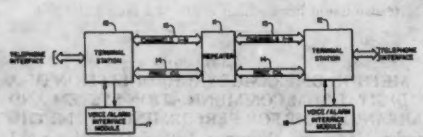
VOICE ALARM SIGNALLING SYSTEM

Thomas J. Nixon, Gaithersburg, Md., and Harold Iley, Huntsville, Ala., assignors to Harris Corporation, Melbourne, Fla.

Filed May 9, 1980, Ser. No. 148,286

Int. Cl.³ H04L 5/00

U.S. Cl. 370—110.1 **30 Claims**



1. In a multichannel communication network wherein information signals are conveyed among a plurality of subscribers by way of a transceiver station to which said information signals are interfaced and transmitted therefrom over respective ones of a plurality of data conveying channels, a system for carrying out voice and/or alarm communications between said transceiver stations comprising:

first means, disposed at a calling transceiver station, for encoding voice and/or alarm signals applied thereto and causing said encoded voice and/or alarm signals to be asynchronously transmitted over each of said plurality of channels so as to be conveyed thereby in addition to said information signals to a called transceiver station, so that the same encoded voice and/or alarm signal that is transmitted over one of said data conveying channels is also conveyed over every other one of said plurality of channels; and

second means, disposed at said called transceiver station, for decoding the asynchronously transmitted encoded voice and/or alarm signals conveyed over a selected one of said plurality of channels and thereby reconstructing said voice and/or alarm signals.

4,347,608

SELF-CHECKING SYSTEM FOR ELECTRONIC PROCESSING EQUIPMENT

Silvano Appiano, Montafia-Asti; Duccio Di Pino, Pino Torinese-Torina, and Cesare Poggio, Turin, all of Italy, assignors to CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Jan. 22, 1980, Ser. No. 114,294

Claims priority, application Italy, Jan. 24, 1979, 67150 A/79

Int. Cl.³ G06F 11/00

U.S. Cl. 371—16 **8 Claims**

1. In a system for the control of a plurality of peripheral units by a processor programmed to exchanged information with said peripheral units,

the combination therewith of a checking unit addressable by said processor during execution of a diagnostic program, said checking unit comprising:

memory means storing a plurality of microprograms each involving the emission of code words in a succession of phases;

timing means responsive to reception of a memory address from said processor for reading out from said memory means to said processor, at a predetermined rate varying for different microprograms, code words pertaining to the successive phases of a microprogram identified by said memory address; and

alarm means triggerable by said processor to indicate a malfunction upon detection of a disparity between code words read out from said memory means and corresponding words simultaneously generated in said processor as part of the latter's diagnostic program;

said timing means including a source of stepping pulses of variable cadence, selector means connected to said source for adjusting said cadence under the control of a memory address received from said processor, and a pulse counter connected to said source for advancement by said stepping pulses.

4,347,609

METHOD AND SYSTEM FOR TRANSMISSION OF SERIAL DATA

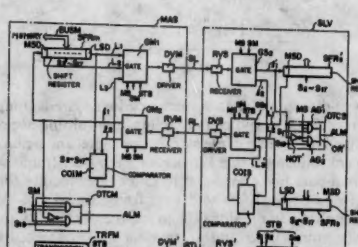
Hiroomi Fukuyama, Hachioji; Shinichi Isobe, Tachikawa; Mikio Yonekura, Hino, and Minoru Kataoka, Tokyo, all of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Aug. 20, 1980, Ser. No. 179,935

Claims priority, application Japan, Sep. 4, 1979, 54-113253

Int. Cl.³ G06F 11/08; H04L 1/14

U.S. Cl. 371—34 **9 Claims**



1. A serial data transmission method for transmitting N-bit serial data (where N is a positive number) from data sending means to data receiving means through data transmission lines, comprising the steps of:

(a) sending a start bit from the data sending means to the data receiving means, through a first of the data transmission

lines, the start bit having a predetermined logical value and being sent before the transmission of the N-bit serial data;

(b) detecting, in the receiving means, whether the logical value of the start bit is the predetermined logical value;

(c) sending, from the data sending means to the data receiving means, the N-bit serial data;

(d) sending back, from the data receiving means to the data sending means, the contents of the received bit serial each time one bit of the bit serial is received by the data receiving means;

(e) comparing bit-by-bit, in the data sending means, the bit serial sent to and returned from the data receiving means;

(f) sending, from the data sending means to the data receiving means, the results of the bit-by-bit comparison as an alarm bit after the transmission of the N-bit serial data;

(g) detecting the logical value of the alarm bit on the data receiving means side to determine if there are any transmission errors; and

(h) issuing a first alarm signal if the logical value of the start bit detected in the data receiving means is different from the predetermined logical value.

4,347,610

CONTROL CIRCUIT FOR THE DRIVE CURRENT OF A LASER

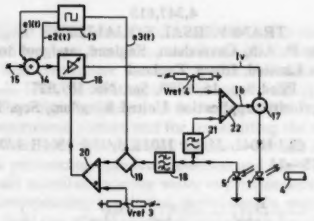
Lambertus J. Meuleman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 22, 1980, Ser. No. 189,289

Claims priority, application Netherlands, Oct. 18, 1979, 7907683

Int. Cl.³ H01S 3/13

U.S. Cl. 372—29 **4 Claims**



1. A control circuit for controlling a component of an injection laser drive current which current is formed by a modulation current component and a bias current component, characterized in that said circuit comprises detection means for detecting in a signal derived from the optical output signal of the laser the intermodulation product signal of at least two signals which are present in the modulation current component with substantially constant amplitudes in order to generate a control signal, and means for comparing the control signal with a reference signal for forming an error signal, and control means for controlling the intensity of the said component of the laser drive current in response to the error signal.

4,347,611

LARGE OPTICAL CAVITY (LOC) MESA LASER

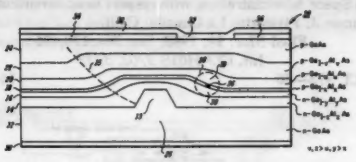
Donald R. Scifres, Los Altos; Robert D. Burnham, Los Altos Hills, and William Streifer, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 6, 1980, Ser. No. 204,431

Int. Cl.³ H01S 3/19

U.S. Cl. 372—45 **6 Claims**

1. In an injection laser having a plurality of contiguous semiconductor layers deposited on a semiconductor substrate, one of said layers fabricated to have a lower bandgap and higher refractive index than at least adjacent layers thereto to form an active layer for carrier recombination and radiation propagation under lasing conditions, cladding layers comprising said adjacent layers, an elongated mesa on the top surface of said substrate whereby during crystal growth of said semiconductor layers, said active layer and cladding layers will form about said mesa, means associated with said laser to confine current to a portion of said active layer, said current confinement means having a longitudinal extent parallel with the elongated extent of said mesa and being displaced therefrom whereby said radiation propagation and radiation emis-



sion from said laser occurs in and from a region in said active layer at the point of said displacement, the improvement comprising at least one radiation confining layer provided between said active layer and one of said cladding layers, said radiation confining layer having a bandgap and index of refraction intermediate of the bandgap and the indices of refraction of said active layer and said one cladding layer, said radiation confining layer forming a large optical cavity for the propagation of said radiation to focus the beam produced thereby into a narrow index guided radiation filament.

4,347,612

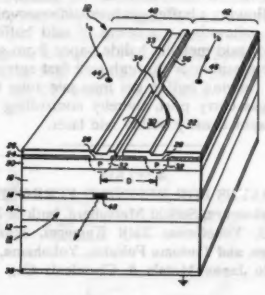
SEMICONDUCTOR INJECTION LASER FOR HIGH SPEED MODULATION

Dan H. Fekete, Palo Alto; Donald R. Scifres, Los Altos, and William Streifer, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 25, 1980, Ser. No. 181,263

Int. Cl.³ H01S 3/19

U.S. Cl. 372—50 **6 Claims**



1. In a semiconductor injection laser for high speed modulation wherein several layers of semiconductor material are fabricated on a semiconductor substrate, one of said layers forming an active layer wherein radiation is generated upon forward biasing of said laser and upon applying pumping current to said active layer in excess of its lasing threshold whereby an optical emitter region is created having an axis along which the generated radiation propagates characterized by optical injector means on the same substrate as said laser and having its own optical emitting region non-colinear with the axis of optical emission of said laser but optically coupled thereto at at least one point therealong and, means operatively associated with said optical injector means to cause said injector means to inject radiation into said laser optical emitter

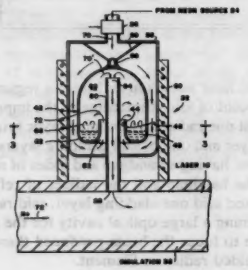
region just prior to or concurrently with the pulsing of said laser to decrease the response time of said laser to pulsed current modulation.

4,347,613

METHOD AND APPARATUS FOR CONVECTION CONTROL OF METALLIC HALIDE VAPOR DENSITY IN A METALLIC HALIDE LASER

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Thomas J. Pivirotto, La Canada, Calif.

Filed Mar. 14, 1980, Ser. No. 130,496
Int. Cl.³ H01S *3/02, 3/22*
U.S. Cl. 372—56 16 Claims



1. In a metallic halide laser comprised of a tube having a first gas entry port, a gas exit port, and a second gas entry port in said tube on the side of said first gas entry port remote from said exit port, and an apparatus for the control of metallic halide vapor density within said laser between said second entry port and said exit port, the combination comprising:

reservoir means for containing a metallic halide material in either a liquid or solid state form;

heating means for varying the temperature of said metallic halide material to effect a predetermined metallic halide vapor density within said reservoir means;

means for flowing a buffer gas into said reservoir means; and

means for exhausting a mixture of said buffer gas and a portion of said metallic halide vapor from said reservoir means into said laser through said first entry port; and

means for flowing buffer gas into said tube through said second gas entry port, thereby controlling the metallic halide vapor density within said laser.

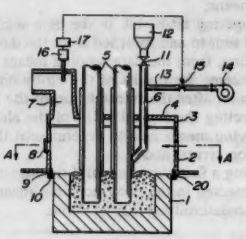
4,347,614

APPARATUS FOR REFINING FERROSILICON

Yoshiyuki Nakamura; Seiichi Matsubara, both of Tokyo; Takashi Matsui, Yokohama; Taiji Kumagai, Ichikawa; Taizo Senga, Waga, and Tsutomu Fukutsu, Yokohama, all of Japan, assignors to Japan Metals & Chemicals Co., Ltd., Tokyo, Japan

Division of Ser. No. 53,480, Jun. 29, 1979, Pat. No. 4,255,184.
This application Mar. 5, 1980, Ser. No. 127,279
Claims priority, application Japan, Jul. 18, 1978, 53-86782; Jul. 18, 1978, 53-86783
Int. Cl.³ H05B *7/00*
U.S. Cl. 373—77 3 Claims

1. A semi-closed electric furnace for refining ferrosilicon, comprising a furnace shell having an upper rim, a heat-shielding hood having an upright wall and arranged over the shell with its lower end spaced from the upper rim of the shell by a gap, vertically arranged electrodes penetrating the heat-shielding hood, pipes arranged around the electrodes and opening above the level of the charged raw materials for charging raw materials into the region of the furnace near and around the electrodes, at least one openable window in the upright wall for poking charged raw materials, a duct for discharging exhaust gas arranged at an upper portion of the heat-shielding hood, a plurality of pressurized air-introducing pipes arranged around the electrodes, each pipe having a lower mouth opening near the level of charged raw materials around the electrodes for suppressing and burning the rising CO gas evolved at the reaction zone and for passing the burnt gas transversely from the electrodes along the surface of the charged raw materials towards the shell, means for adjusting the gap between the lower end of the upright wall and the upper rim of the shell, means for determining the concentration of oxygen in the exhaust gas, and means for controlling the sum of the volume of the air introduced by way of the air-introducing pipes and the air invaded into the heat-shielding hood from the gap and the poking window and for controlling the ratio of invaded air volume to the sum of introduced air volume plus the invaded air volume depending on the concentration of oxygen in the exhaust gas.

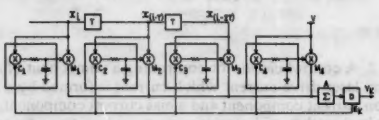


4,347,615

TRANSVERSAL EQUALIZERS

Christopher P. Ash, Caversham, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Sep. 16, 1980, Ser. No. 187,827
Claims priority, application United Kingdom, Sep. 19, 1979, 7932403
Int. Cl.³ H04L *25/03;* H03K *5/159;* H04B *3/04*
U.S. Cl. 375—14 2 Claims



1. An adaptive equaliser receiving an input signal susceptible to an original d.c. offset, and comprising in combination:

a plurality of stages, including second and subsequent stages which include a tapped delay line providing a time-spaced sample of the input signal applied to a first stage of the plurality of stages, and wherein each stage further includes a correlator and a multiplier, the correlator and the multiplier of the first stage being arranged to receive the input signal, and the correlator and the multiplier of the second and subsequent stages being arranged to receive the respective time-spaced sample of the input signal, each said correlator further receiving an error signal and providing an output signal to its respective said multiplier, said respective multiplier being arranged to provide a further output signal;

accumulator means for receiving and summing the further output signals from the multipliers to provide a summation output signal;

a further stage including a fixed voltage source, a further correlator and a further multiplier, each having an input connected to said fixed voltage source, said further corre-

lator receiving the error signal and provide a further output signal to the further multiplier, said further multiplier providing a multiplier output signal to said accumulator, said accumulator summing said multiplier output signal of said further multiplier with said further output signals of said multipliers; and

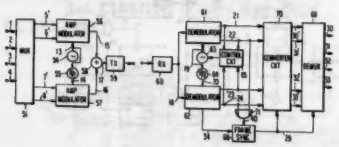
decision circuit means for receiving the summation output signal from said accumulator means and for comparing said summation output signal with a reference signal to provide a decision output signal and said error signal, said error signal being applied to said correlators to correct residual error, and to the further correlator of said further stage to control the gain of the further multiplier, whereby to compensate for the original d.c. offset in the input signal.

4,347,616

DIGITAL MULTI-LEVEL MULTI-PHASE MODULATION COMMUNICATION SYSTEM

Masatoshi Murakami, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1980, Ser. No. 173,539
Claims priority, application Japan, Jul. 31, 1979, 54-97792
Int. Cl.³ H04L *27/18*
U.S. Cl. 375—20 **5 Claims**



1. A digital multi-phase multi-level modulation communication system having a transmitter section and a receiver section, wherein said transmitter section comprises means for multi-phase multi-level modulating a carrier wave with at least four trains of first digital signals each including a first frame signal of a predetermined pattern and for transmitting the modulated carrier wave, and wherein said receiver section comprises means for performing coherent detection and multi-level decision on said modulated carrier wave to provide second digital signals corresponding to said first digital signals, means responsive to at least one of said second digital signals for establishing frame synchronization and providing frame timing, means responsive to said frame timing for extracting second frame signal corresponding to said first frame signal from said second digital signals, and means responsive to said second frame signal and said second digital signals for changing the trains of said second digital signals and the polarities thereof to reproduce said first digital signals from said second digital signals.

4,347,617

ASYNCHRONOUS TRANSMISSION SYSTEM FOR BINARY-CODED INFORMATION

Kazuo Murano, Tokyo; Kazuo Yamaguchi, Hiratsuka; Norio Murakami, Yokohama, and Toshitaka Tsuda, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 26, 1980, Ser. No. 210,850
Claims priority, application Japan, Nov. 27, 1979, 54/153403; Nov. 30, 1979, 54/155009; Nov. 30, 1979, 54/155010
Int. Cl.³ H03K *5/26*
U.S. Cl. 375—22 **8 Claims**

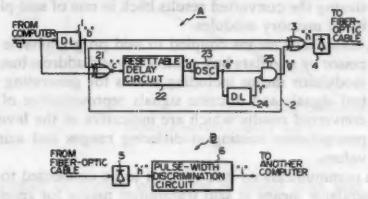
1. An asynchronous transmission system for binary coded information comprising:

first receiving means for receiving a binary-coded signal;

delaying means, operatively connected to said first receiving means, for delaying said binary-coded signal and for generating a delayed binary-coded signal;

refresh pulse generating means, operatively connected to said first receiving means and to said delaying means, for generating refresh pulses after a period of successive data of the same code in said delayed binary-coded signal are received for a predetermined period of time and before a next change in said binary-coded signal is received, the pulse width of said refresh pulses being smaller than a minimum period of data;

combining means, operatively connected to said delaying means and to said refresh pulse generating means, for combining said delayed binary-coded signal with said refresh pulses and for generating a combined signal, the polarity of said refresh pulses being opposite to that of said delayed binary-coded signal;



transmitting means, operatively connected to said combining means, for transmitting said combined signal as a transmitted signal;

second receiving means, operatively connected to said transmitting means, for receiving and passing therethrough said transmitted signal; and

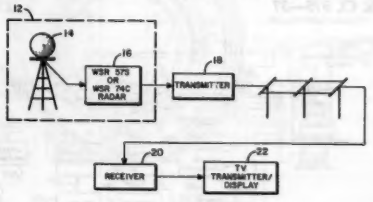
pulse-width discriminating means, operatively connected to said second receiving means, for removing said refresh pulses from said transmitted signal and for generating and transmitting a received signal so that said binary-coded signal is restored.

4,347,618

APPARATUS FOR PROCESSING WEATHER RADAR INFORMATION

Stephen P. Kavouras, 9450 Cedar Ave. South, Bloomington, Minn. 55424; Paul C. Post, Eagan, Minn.; Roderick A. Wells, St. Louis Park, Minn., and Stephen L. Rutkowski, Savage, Minn., assignors to Stephen P. Kavouras, Bloomington, Minn.

Filed Jun. 30, 1980, Ser. No. 164,881
Int. Cl.³ H04B *17/00*; G01S *7/04*
U.S. Cl. 375—37 **14 Claims**



1. A system for relaying weather radar data from a radar apparatus at a transmitting site to a remote receiving site comprising in combination:

(a) transmitter means coupled to receive radar video signals in a polar coordinate format representative of differing levels of precipitation, elevation, azimuth and range from said radar apparatus, said transmitter means including;

i. sensitivity time correction means for modifying said radar video signals representative of levels of precipitation as a function of said radar video signals from said radar apparatus representative of range,

ii. buffering means coupled to said sensitivity time correction means for at least temporarily storing the modified

signals representative of levels of precipitation for each of a plurality of ranges at a given azimuth,

iii. A programmable processor having a central processor unit, and a plurality of memory modules each coupled thereto by a data bus, a control bus and an address bus,

iv. means coupling said buffering means to one of said plurality of memory modules via said data bus for entering the contents of said buffering means into said one of said plurality of memory modules at addressable locations therein,

v. means including said programmable processor for converting the data entered into said one of said memory modules from said buffering means from a polar coordinate format to a rectangular coordinate format and for storing the converted results back in one of said plurality of memory modules,

vi. modulator means coupled to said programmable processor by said data bus, control bus and address bus, said modulator means including means for generating control signals and discrete signals representative of said converted results which are indicative of the levels of precipitation existing at differing ranges and azimuth values,

(b) a communications link adapted to be connected to said modulator means in said transmitter means for receiving said discrete signals indicative of levels of precipitation and said generated control signals; and

(c) receiver means coupled to said communications link for receiving said discrete signals indicative of levels of precipitation and said generated control signals, said receiver means including;

i. demodulation means for re-converting the received discrete signals to digital values indicative of levels of precipitation,

ii. memory means coupled to said demodulation means for storing said digital values into a plurality of range dependent groupings, and

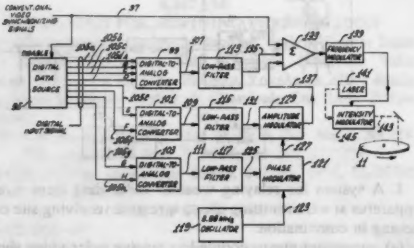
iii. means coupled to the output of said memory means for converting the digital values sequentially read from said receiver's memory means to a composite video signal suitable for controlling video display apparatus.

4,347,619

DIGITAL FORMATTING SYSTEM

Wayne R. Dakin, Huntington Beach, Calif., and Jordan Isailovic, Belgrade, Yugoslavia, assignors to Discovision Associates, Costa Mesa, Calif.

Filed Dec. 19, 1980, Ser. No. 218,584
Int. Cl.³ H04N 9/36; H04L 25/49
U.S. Cl. 375—37 **27 Claims**



1. A method of formatting digital information into a format similar to that of a color video signal, comprising steps of:

converting the digital information into a first multi-level signal and a second multi-level signal, each signal having at least two signal states, and each level of said multi-level signals representing a corresponding arrangement of binary states of said digital information;

providing a subcarrier having a prescribed frequency;

modulating the subcarrier in accordance with the second multi-level signal;

providing video synchronization signals; and

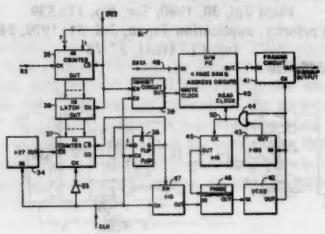
summing together the first multi-level signal, the modulated subcarrier, and the synchronization signals, to produce a composite signal having a format similar to that of a color video signal.

4,347,620

METHOD OF AND APPARATUS FOR REGENERATING A SIGNAL FREQUENCY IN A DIGITAL SIGNAL TRANSMISSION SYSTEM

David H. A. Black, Chelsea; Georges H. Pelletier, Aylmer, and Hing F. Lee, Ottawa, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Sep. 16, 1980, Ser. No. 187,815
Int. Cl.³ H04L 7/00
U.S. Cl. 375—112 **8 Claims**



1. In a digital signal transmission system in which digital signals at a first frequency are synchronized with positive stuffing to a second, slightly higher, frequency for transmission, a stuffing signal is transmitted to identify the location of each item of stuffed information, and received signals at said second frequency are desynchronized to said first frequency by writing the received signals, but not the stuffed information, into a memory and reading signals from the memory at the first frequency, a method of producing a first signal at the first frequency at a receiver of the system comprising the steps of:

producing from the received signals a second signal at said second frequency;

comparing the relative phases of writing into and reading from the memory in respect of each stuffing signal;

producing a third signal at a frequency which is dependent upon the stuffing frequency modified in dependence upon each comparison of said relative phases;

generating said first signal using an oscillator; and

controlling the oscillation frequency of the oscillator in dependence upon phase differences between the first signal and the second signal reduced in frequency by the frequency of the third signal.

4,347,621

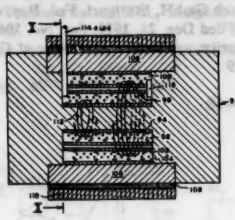
TROCHOIDAL NUCLEAR FUSION REACTOR

William G. Dow, Ann Arbor, Mich., assignor to Environmental Institute of Michigan, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 845,325, Oct. 25, 1977. This application Jun. 3, 1980, Ser. No. 156,034
The portion of the term of this patent subsequent to Jan. 13, 1998, has been disclaimed.
Int. Cl.³ G21B 1/00
U.S. Cl. 376—139 **8 Claims**

3. The method of producing and confining a stream of fusionable ions as in claim 1 wherein said electric field has a variable potential thereacross, said stream comprising a plural-

ity of streams of high kinetic energy fusionable ions and space-charge neutralizing electrons, said streams having a different



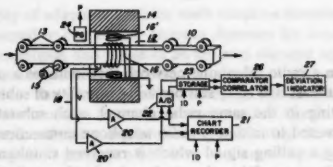
average potentials and introduced into said crossed electric and magnetic fields at distinct equipotential locations.

4,347,622

SIGNATURE SURVEILLANCE OF NUCLEAR FUEL

Henry Bernatowicz, Fremont, Calif., and Frederick C. Schoenig, Jr., Wilmington, N.C., assignors to General Electric Company, San Jose, Calif.

Filed Apr. 7, 1980, Ser. No. 137,592
Int. Cl.³ G21C 17/00; G01R 33/16
U.S. Cl. 376—245 22 Claims



1. A method for surveillance of nuclear fuel material in an elongated fuel material containing container, wherein said fuel material includes distributed ferromagnetic particles, comprising the steps of:

(1) providing apparatus for scanning said container to produce susceptibility change signals indicative of changes in magnetic susceptibility of said material along the length of said container due to said ferromagnetic particles;

(2) performing a first scan along the length of said container at a given time in its life to produce a first susceptibility change signal as a first signature of said fuel material containing container;

(3) recording said first signature;

(4) performing a second scan along the length of said container at a subsequent time in its life to produce a second susceptibility change signal as a second signature of said fuel material containing container; and

(5) comparing said second signature to said first signature whereby similarity of the signatures indicates absence of tampering.

4,347,623

FLASH JET COOLANT PUMPING SYSTEM

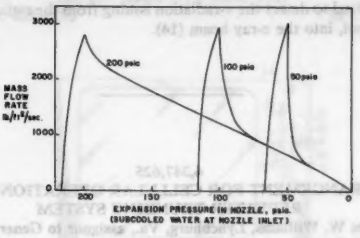
A. O. Winfried Reinsch, 13140 Carousel La., Del Mar, Calif. 92014

Continuation of Ser. No. 920,985, Jun. 30, 1978, which is a continuation-in-part of Ser. No. 684,853, May 10, 1976, abandoned. This application Jul. 29, 1980, Ser. No. 173,416
Int. Cl.³ G21C 15/18
U.S. Cl. 376—392 14 Claims

1. A system using the energy of heated water for pumping water into a vessel, such system comprising:

a flash jet pump having a nozzle with converging and diverging sections, said converging section being connected to receive water from the source of saturated water, said converging and diverging sections being sized for, and comprising means for, flashing a portion of said saturated water into steam, in said divergent section of said nozzle and producing a super-sonic two-phase flow wherein the ratio of the nozzle outlet area to the nozzle throat area is in the range of 10:1 to 50:1,

a housing surrounding said flash jet pump,



a source of cooled water that is cooler than said heated water connected to said housing for being drawn into said super-sonic two-phase flow downstream of said divergent section of said nozzle,

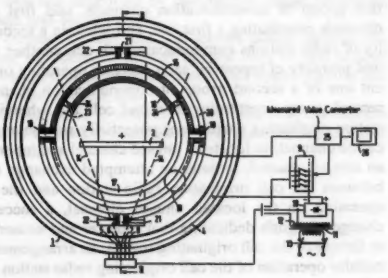
the outlet of said flash jet pump is connected to discharge the combined flow of said saturated water and said cooled water into said vessel.

4,347,624

X-RAY DIAGNOSTIC APPARATUS FOR PRODUCING TRANSVERSE LAYER IMAGES

Edgar Tschunt, Rathsberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Division of Ser. No. 875,385, Feb. 6, 1978, Pat. No. 4,219,733. This application Jan. 28, 1980, Ser. No. 115,751
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1977, 2714759
Int. Cl.³ G03B 41/16
U.S. Cl. 378—10 8 Claims



1. An x-ray diagnostic apparatus for producing transverse layer images of a radiography subject with an x-ray measuring arrangement comprising an x-ray source which produces a fan-shaped x-ray beam penetrating the radiography subject, the cross-sectional extent of the beam, perpendicular to the layer plane, being equal to the layer thickness and, in the layer plane, being of such a magnitude that the entire layer is penetrated with radiation, and comprising also a radiation receiver which detects the intensity of radiation emanating from the layer, said radiation receiver being constructed as a circular ring into which the radiography subject may be inserted and comprising a series of detectors, with means for changing the

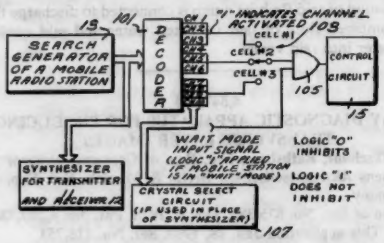
direction of the axis of symmetry of the x-ray beam to effect a scanning operation, and with a measured value converter for the transformation of the signals supplied by the radiation receiver during a scanning operation into a layer image, characterized in that the x-ray source (1) is arranged outside the radiation receiver (15), in that the radiation receiver (15) has gimbal mounting means, and guide means (24) acting on said radiation receiver (15) for swiveling that particular part of the circular ring forming the radiation receiver (15), which is required to detect the x-radiation issuing from the radiography subject, into the x-ray beam (14).

4,347,625

ARRANGEMENT FOR CELLULAR OPERATION OF A REPEATER TRUNKING SYSTEM

James W. Williams, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Jun. 16, 1980, Ser. No. 159,650
Int. Cl.³ H04B 7/14, 1/44, 1/00
U.S. Cl. 455—17 26 Claims



1. In a repeater trunking system wherein a first plurality of radio stations communicate with one another via a first plurality of repeaters, each repeater operating on a different one of a first group of communication channels, said first group of channels constituting a first cell, and wherein a second plurality of radio stations communicate with one another via a second plurality of repeaters, each repeater operating on a different one of a second group of communication channels, said second group constituting a second cell and wherein a radio station originating a call scans potentially available communication channels to locate an unused channel and, upon locating an unused channel, initiates an attempted exchange of signals between the call originating radio station and the repeater operating on the located unused channel, a successful exchange of signals dedicating that repeater and unused channel to the use of the call originating station, an arrangement for the cellular operation of the call originating radio station comprising:

means for generating signals on each of the communication channels of both the first and second groups of communication channels for scanning to find an unused channel within either said first or second group;

means for initiating an attempted exchange of signals on each channel scanned to determine whether that particular communications channel is unused; and

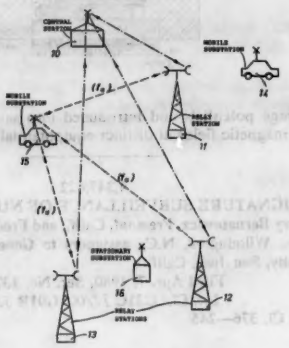
means coupled to said generating means for selecting operation in either said first or second cell, the selection of a cell selectively inhibiting the completion of such an attempted exchange of signals on any channel not within the selected cell, whereby said radio station, operating in a call originate mode, scans only the channels of the selected cell.

4,347,626

RADIO TELEPHONE COMMUNICATION NETWORK

Manfred Wenzel, Berlin, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 21, 1979, Ser. No. 106,159
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1978, 2856019
Int. Cl.³ H04B 7/26
U.S. Cl. 455—18 8 Claims



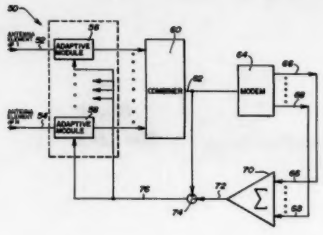
1. In a radio telephone network that includes a central station, at least two relay stations and a plurality of substations, all operating in the same radio channel, each substation being constructed to initiate a radio telephone connection by transmitting a calling signal which is received simultaneously by more than one of the relay stations, each relay station including a respective evaluator constructed to evaluate each received calling signal and means controlled by the evaluator for emitting, to the central station, an identification signal characteristic of the relay station upon recognition of a calling signal as the correct one, and the central station being constructed to transmit a selective calling signal characteristic for only that relay station whose identification signal is received first by the central station to cause the latter relay station to switch through the radio telephone connection, the improvement wherein, in each said relay station, said evaluator serves to detect selective calling signals emitted by the central station and not characteristic for its respective relay station, and each said relay station includes a time storage unit comprising: time delay means connected to said evaluator of its respective relay station to be switched, in response to recognition of a calling signal by said associated evaluator, from a reset state in which it is inactive to a set state in which it triggers emission of an identification signal after a delay period which is characteristic of said relay station and which differs from that of all other relay stations in the network such that a first one of said relay stations has a characteristic delay period which is shorter than that of all other relay stations and a second one of said relay stations has a characteristic delay period which is longer than that of all other relay stations; and means responsive to detection of such selective calling signal by its associated evaluator subsequent to recognition of a calling signal and prior to emission of a resulting identification signal for returning said time delay means to its reset state and preventing emission of that identification signal, and said first one of said relay stations further comprises means for automatically returning its said time delay means to its reset state at the end of a time interval which follows recognition of a calling signal and is longer than the delay period characteristic of said second one of said relay stations in the network.

4,347,627

ADAPTIVE ARRAY PROCESSOR AND PROCESSING METHOD FOR COMMUNICATION SYSTEM

Larry D. Alter, Treasure Island, Fla., assignor to E-Systems, Inc., Dallas, Tex.

Filed Feb. 26, 1979, Ser. No. 15,232
Int. Cl.[3] H04B 7/08
U.S. Cl. 455—136 4 Claims



1. An adaptive array processor for nulling directional interference signals and optimizing gain for received signals for use in a multi-channel communication system having a plurality of antenna elements producing antenna element signals, comprising:

a plurality of adaptive modules, each adaptive module being connected to one of said antenna elements for modifying the magnitude and phase of an antenna element signal to produce a processed signal;

a combiner for combining the processed signals from said adaptive modules to produce a summation signal;

a modem for dividing and processing noise from the summation signal to produce a plurality of channel signals with a reduced overall interference level relative to the summation signal;

summer means for summing the channel signals to produce a composite reference signal having a reduced interference level relative to the summation signal;

subtractor means for subtracting the composite reference signal from the summation signal to produce an error signal which corresponds to the interference level in the summation signal relative to the composite reference signal;

transmission means for applying the error signal to said adaptive modules to perform a control function; and

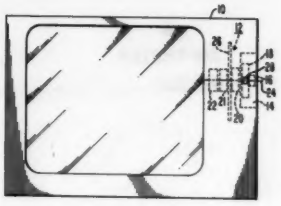
said adaptive modules being responsive to the error signal for modifying the phase and magnitude of the antenna element signals to null interfering signals received on the antenna elements and to enhance the signal-to-interference ratio in the summation signal.

4,347,628

ROTARY TUNING MECHANISM

Walter F. Speer, Speedway City, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 28, 1980, Ser. No. 201,440
Int. Cl.[3] H04B 1/16; H03J 5/04
U.S. Cl. 455—173 10 Claims



1. In a receiver tuning apparatus system including an automatic fine tuning (AFT) circuit, apparatus comprising:

a gear wheel having an axis and a circumferential surface disposed around said axis and a face surface substantially perpendicular to said axis;

a plurality of first teeth extending from said circumferential surface;

a plurality of second teeth extending from said face surface;

a shaft directed along the axis of said gear wheel;

a spacer having at least one surface defining a plane substantially perpendicular to said axis at a predetermined distance from said face surface;

said gear wheel, said first and second teeth, said shaft and said spacer being part of an integral structure of a dielectric material;

a housing having first and second planar sections;

said surface of said spacer engaging said first planar section at said predetermined distance;

at least two detent members symmetrically disposed about said axis and supported by said second planar section to engage said second teeth;

means connecting said first and second planar sections for urging said detent members against ones of said second teeth and for urging said surface of said spacer against said first planar section; and

a switch connected to said AFT circuit and having a contact member located so that said contact member engages said first teeth.

DESIGN PATENTS

GRANTED AUG. 31, 1982

ERRATA

For CLASS	See PATENT NO.
D32–025	265,999

DESIGN PATENTS

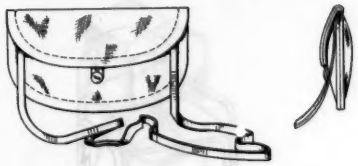
GRANTED AUG. 31, 1982

ERRATA

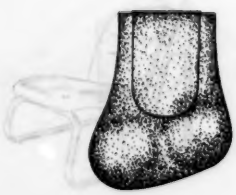
Cla	No
CLASS	PATENT NO.
D12-012	265,089

265,945
SUPPORT FOR EAR PROTECTOR
Bo G. Lönnstedt, Kvarnbergsvagen 23, S-141 45 Huddinge, Sweden
Filed Nov. 27, 1979, Ser. No. 98,299
Claims priority, application Sweden, May 28, 1979, 79-1334
Term of patent 14 years
Int. Cl. D2—*99*
U.S. Cl. D2—232

265,946
EYEGLASS CASE
Lily Lerner, 6 Graystone Rd., Asheville, N.C. 28804
Filed Jan. 15, 1980, Ser. No. 113,028
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—34



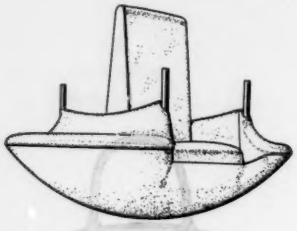
265,947
POUCH
Peter Nienstaedt, 9th Floor, Granville House 41C, Granville Rd., Kowloon, Hong Kong
Filed Apr. 16, 1980, Ser. No. 140,860
Claims priority, application United Kingdom, Jan. 14, 1980, 993154
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—52



265,948
LUGGAGE
Ted Stark, Montclair, N.J., assignor to M & M Luggage Co., Inc., Jersey City, N.J.
Filed Oct. 17, 1980, Ser. No. 197,779
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

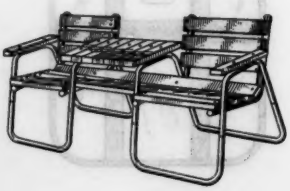
265,949
GARMENT BAG
Ted Stark, Montclair, N.J., assignor to M & M Luggage Co., Inc., Jersey City, N.J.
Filed Oct. 17, 1980, Ser. No. 197,781
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

265,950
ROCKING SEAT
Rosemary E. A. Martin, 7 Trentishoe Mansions, 90 Charing Cross Rd., London WC2H OJE, England
Filed Dec. 11, 1979, Ser. No. 102,402
Claims priority, application United Kingdom, Jun. 14, 1979, 79990302
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—10

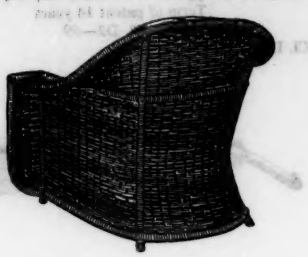


265,951
STOOL OR SIMILAR ARTICLE
Anthony W. Simpson, 5 South St., St. Johnsbury, Vt. 05819
Filed Dec. 5, 1979, Ser. No. 100,698
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—29

265,952
COMBINED MULTIPLE SEATING UNIT AND TABLE
George Theodore, Strongsville, Ohio, assignor to Cardinal American Corporation, Cleveland, Ohio
Filed Jan. 28, 1980, Ser. No. 115,943
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—45



265,953
CHAIR
Henry Olko, Chicken Valley Rd., Locust Valley, N.Y. 11560
Filed Oct. 18, 1979, Ser. No. 86,078
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—57



265,954
CHAIR
Gae Aulenti, Milan, Italy, assignor to Knoll International, Inc., New York, N.Y.
Division of Ser. No. 827,609, Aug. 25, 1977. This application Mar. 24, 1980, Ser. No. 133,476
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—73

265,955
SEAT
William B. Raftery, Ann Arbor, and Ronald L. Whitwam, Caledonia, both of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.
Filed Jun. 11, 1979, Ser. No. 47,098
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—75

265,956

TOILET/BIDET CABINET

Gregory Wolf, West Reading; Scott Sandman, Fleetwood, and Clark Pearson, Birdsboro, all of Pa., assignors to The Tappan Company, Mansfield, Ohio

Filed Oct. 5, 1979, Ser. No. 82,122
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—127

265,957

STORAGE CABINET FOR A BATHROOM

Gregory Wolf, West Reading; Scott Sandman, Fleetwood, and Clark Pearson, Birdsboro, all of Pa., assignors to The Tappan Company, Mansfield, Ohio

Filed Oct. 5, 1979, Ser. No. 82,123
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—170

265,958

SHELVING UNIT

Frederick E. Markus, 20 Park Ave., Belmont, Mass. 02178

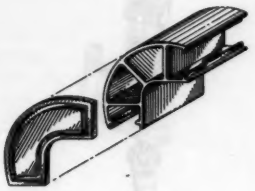
Filed Sep. 20, 1979, Ser. No. 77,292
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186

265,959

CORNER CONNECTOR FOR FURNITURE PANELS

Alan E. Blum, Frontenac, and Thomas F. Gambon, St. Louis, both of Mo., assignors to Charleswood Furniture Corp., Wright City, Mo.

Filed Aug. 13, 1979, Ser. No. 65,895
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—191



265,960

CHAIR BACK OR SIMILAR ARTICLE

Richard McCarthy, 280 Halcyon Ave., Winston-Salem, N.C.

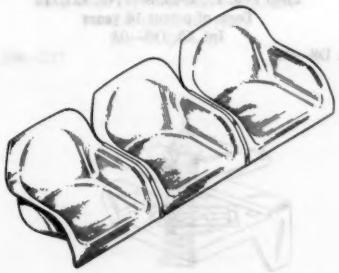
Filed Oct. 22, 1979, Ser. No. 87,434
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—197

265,961

MULTIPLE SEATING UNIT

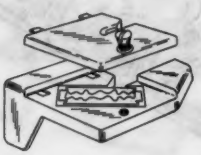
Warren H. Snodgrass, 223 Woodland Rd., Kentfield, Calif. 94904

Division of Ser. No. 61,485, Jul. 27, 1979. This application Apr. 24, 1981, Ser. No. 257,121
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—197



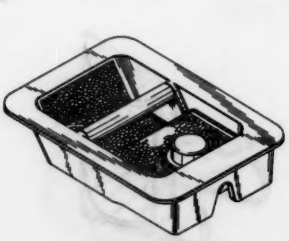
265,962
RATCHET TYPE SOCKET WRENCH
Osamu Izumisawa, No. 24-10, 2 chome asahico, Nerimaku, Tokyo, Japan
Filed Nov. 30, 1979, Ser. No. 99,028
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—25

265,963
SLITTER
Harold G. Murdock, 30 Eastfield Dr., Rolling Hills, Calif. 90274, and Laverne B. Moore, 17701 Avalon, Space 288, Carson, Calif. 90746
Filed Feb. 15, 1980, Ser. No. 121,713
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—98



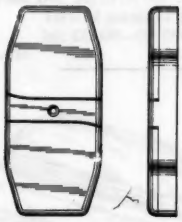
265,964
COMBINED HOLDER FOR A MAGNIFIER AND A LETTER-OPENER
Walter Henkels, Holunderweg 1, 5142 Hückelhoven, Fed. Rep. of Germany
Filed Jul. 2, 1980, Ser. No. 165,420
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1980, MR 130
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D8—104

265,965
LATCH HOUSING WITH PUSH BUTTON
Edwin W. Davis, Medina, and Lee S. Weinerman, Cleveland, both of Ohio, assignors to The Eastern Company, Cleveland, Ohio
Filed Mar. 19, 1980, Ser. No. 131,779
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—302



265,966
HOOD FOR PREVENTING OBSERVATION OF A KEYSET
Ingvar Freijd, Linköping, Sweden, assignor to Datasaab AB, Jarfalla, Sweden
Filed Aug. 28, 1979, Ser. No. 70,459
Claims priority, application Sweden, Mar. 2, 1979, 79-0546
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—346

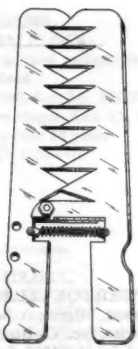
265,967
ELECTRIC OUTLET COVER
Fredric M. Newman, 29040 Apple Blossom La., Farmington Hills, Mich. 48018
Filed May 16, 1980, Ser. No. 150,560
Term of patent 14 years
Int. Cl. D8—*09*; D13—*03*
U.S. Cl. D8—350



265,968
HATCH FOR A POWER SUPPLY CORD
Paul Bergin, 58471 Fir Rd., South, Mishawaka, Ind. 46544
Filed Feb. 29, 1980, Ser. No. 125,962
Term of patent 14 years
Int. Cl. D13—*04*
U.S. Cl. D8—352

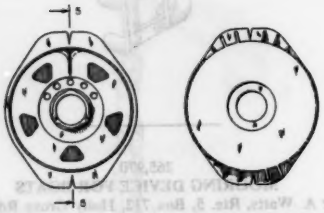
265,969
WIRE MOUNTING CLIP
Juergen R. Koessler, 6271 Nicolle Pl., Richmond, British Columbia, Canada (V7C 4V7)
Filed Mar. 6, 1980, Ser. No. 127,905
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—354

265,970
MOORING DEVICE FOR BOATS
Homer A. Watts, Rte. 5, Box 712, Holly Grove Rd., Thomasville, N.C. 27360
Filed Jan. 18, 1979, Ser. No. 4,384
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—395

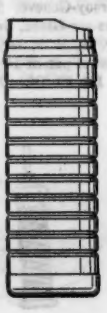


265,971
PERFUME BOTTLE
Albert Kaufmann, Versoy-Geneve, Switzerland, assignor to Interdica S.A., Villars-sur-Glane, Switzerland
Filed Mar. 19, 1979, Ser. No. 22,075
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—337

265,972
DISPENSER FOR SURGICAL SUTURES
Seymour Black, West Hartford, Conn., assignor to American Cyanamid Company, Stamford, Conn.
Filed Apr. 3, 1980, Ser. No. 136,850
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—339



265,973
DISPENSER FOR CLEANING POWDERS
Jean-Marie Gombert, Mignaloux-Beauvoir, France, assignor to Airwick Industries, Inc., Carlstadt, N.J.
Filed Jan. 14, 1980, Ser. No. 111,565
Claims priority, application Switzerland, Jul. 20, 1979, 110634/79
Term of pctent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—366



265,974
DISPENSER FOR SOLID MATERIAL
Jean-Marie Gombert, Mignaloux-Beauvoir, France, assignor to Airwick Industries, Inc., Carlstadt, N.J.
Filed Jan. 28, 1980, Ser. No. 116,357
Claims priority, application Switzerland, Aug. 7, 1979, 110662/79
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—366

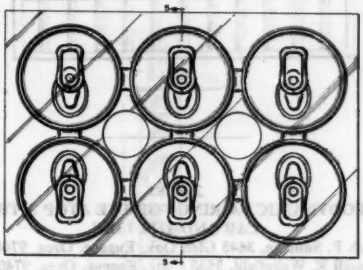
265,975
FLASK
Marcel Vaussanvin, Tournus, France, assignor to Manufacture Metallurgique de Tournus, S.A., Tournus, France
Filed Jul. 25, 1979, Ser. No. 60,372
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—406

265,976
DISPLAY HOLDER
Barbara Astor, Pelham Manor, and Terry E. Snyder, New York, both of N.Y., assignors to Revlon, Inc., New York, N.Y.
Filed Mar. 12, 1979, Ser. No. 19,444
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—415

265,977
GLOVE BOX
Murray Strongwater, 822 Moore St., Woodmere, N.Y. 11598
Filed Dec. 26, 1979, Ser. No. 106,701
Term of patent 14 years
Int. Cl. D3—*02;* D9—*03*
U.S. Cl. D9—424

265,978
CAP FOR TELESCOPIC SIGHT TURRET
Fred L. Jennie, Newport Beach, Calif., assignor to Fontaine Industries, Inc., Garden Grove, Calif.
Filed Jan. 15, 1980, Ser. No. 112,370
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—453

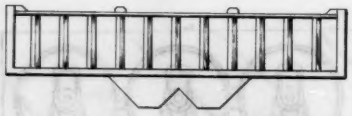
265,979
CAN CARRIER
Horst F. W. Arfert, Midlothian, Va., assignor to Reynolds Metals Company, Richmond, Va.
Filed Mar. 17, 1980, Ser. No. 130,745
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—344



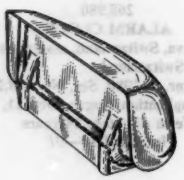
265,980
ALARM CLOCK
Joseph Kanoui, Geneva, Switzerland, assignor to Interdica S.A., Villars-sur-Galen, Switzerland
Filed Apr. 9, 1980, Ser. No. 138,273
Claims priority, application Hague, Oct. 11, 1979, 69435
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—26

265,981
STERILIZATION INDICATOR
John M. Chizacky, Pompton Plains, N.J., assignor to Akzona Incorporated, Asheville, N.C.
Filed May 24, 1979, Ser. No. 42,384
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57

265,982
HOPPER DUMP TRUCK BOX
Wayne Miller, R.R. #1, Petersfield, Manitoba, Canada (R0C 2L0)
Filed Mar. 7, 1980, Ser. No. 128,048
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—15



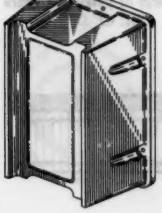
265,983
AERODYNAMIC FAIRING FOR USE ATOP A TRUCK CAB AND THE LIKE
Patrick F. Sullivan, 3645 Glen Oak, Eugene, Oreg. 97405, and Russell R. Wakefield, 5535 Cody, Eugene, Oreg. 97402
Filed Mar. 19, 1981, Ser. No. 245,455
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—181



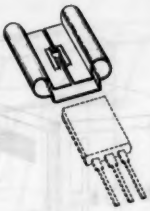
265,984
VEHICLE WHEEL
John A. Main, Plymouth, Mich., assignor to Kelsey-Hayes Co., Romulus, Mich.
Filed Jan. 14, 1980, Ser. No. 111,575
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—212

265,985
RECHARGEABLE BATTERY PACK
Lawrence E. House, II, Baltimore, Md., assignor to Black & Decker, Inc., Newark, Del.
Filed Oct. 17, 1979, Ser. No. 86,029
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—4

265,986
ELECTRONIC ENCLOSURE COVER
Henry W. Wearsch, Concord Township, Lake County; Ronald A. Marino, Chester Township, Geauga County; Joseph Ludvik, Lyndhurst, and William H. Rowe, Chagrin Falls, all of Ohio, assignors to Reliance Electric Company, Cleveland, Ohio
Filed Jan. 30, 1980, Ser. No. 116,937
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—13

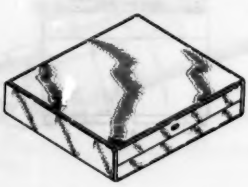


265,987
SELF-HOLDING HEAT SINK FOR ELECTRONIC DEVICES
Alfred F. McCarthy, Belmount, N.H., assignor to Aavid Engineering, Inc., Laconia, N.H.
Filed Feb. 25, 1980, Ser. No. 124,308
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—23

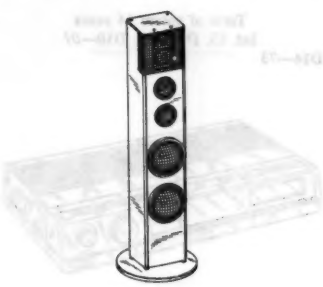


265,988
INLINE FUSE HOLDER
John B. Gordon, 55215 Mayflower Rd., South Bend, Ind. 46628
Filed Apr. 4, 1980, Ser. No. 137,266
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—35

265,989
CONTAINER FOR SMALL ELECTRONIC STRUCTURAL COMPONENTS
Bobby J. Harris, 2954 Sunwood Dr., San Jose, Calif. 95111, and James P. Sayers, 10534 Merriman Rd., Cupertino, Calif. 95014
Filed Dec. 19, 1979, Ser. No. 105,396
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D13—41

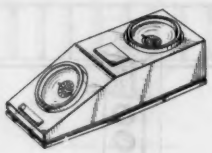


265,990
COLUMNAR LOUDSPEAKER
Peter Hartwein, Koenigstein, and Peter Schneider, Kronberg, both of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany
Filed Aug. 22, 1979, Ser. No. 68,713
Term of patent 3½ years
Int. Cl. D14—*01*
U.S. Cl. D14—34

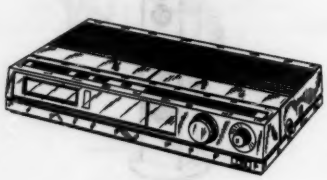


265,991
TRANSMISSION SWITCHING EQUIPMENT CABINET
Peter D. H. Trussler, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed Oct. 31, 1979, Ser. No. 89,940
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—52

265,992
ACOUSTIC COUPLER
Takashi Hirata, and Kunio Hirose, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 9, 1979, Ser. No. 82,910
Claims priority, application Japan, Apr. 9, 1979, 54-14364
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—57

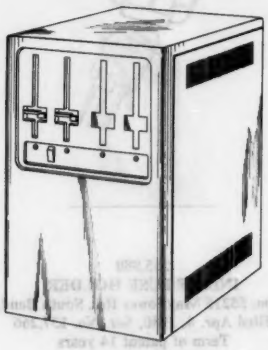


265,993
CLOCK RADIO RECEIVER
Hans T. Meelen, Geldrop, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jul. 25, 1980, Ser. No. 172,316
Claims priority, application United Kingdom, Feb. 1, 1980, 993425
Term of patent 14 years
Int. Cl. D14—*03;* D10—*01*
U.S. Cl. D14—73



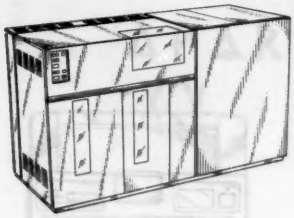
265,994
FACSIMILE RECORDER AND TRANSCEIVER
Manzo Yoshihama, Yokohama, and Fumiyo Kojima, Hiratsuka, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Mar. 12, 1980, Ser. No. 129,760
Claims priority, application Japan, Sep. 17, 1979, 54-39067
Term of patent 7 years
Int. Cl. D14—*02, 01*
U.S. Cl. D14—94

265,995
CONTROL UNIT FOR A DISTRIBUTED DATA SYSTEM
Collan B. Kneale, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 12, 1979, Ser. No. 102,602
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—107



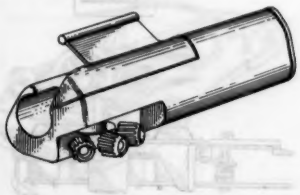
265,996
CONTROLLER FOR COMPUTER PRINTING SYSTEM
Masahiro Kando, Tokyo, and Yoshinori Sugiura, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 24, 1980, Ser. No. 115,007
Claims priority, application Japan, Jul. 30, 1979, 54-31987
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—107

265,997
PRINTER FOR COMPUTER SYSTEM
Masahiro Kando, Tokyo, and Nori Kato, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 24, 1980, Ser. No. 114,891
Claims priority, application Japan, Jul. 30, 1979, 54-31988
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—111

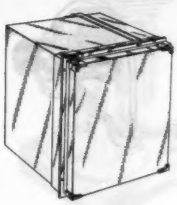


265,998
WIND ROTOR
Joseph A. Wagle, and Joseph H. Wagle, both of 6503 W. 71st St., Indianapolis, Ind. 46278
Filed Apr. 2, 1979, Ser. No. 25,984
Term of patent 14 years
Int. Cl. D15—*1*
U.S. Cl. D15—1

265,999
SPRINKLER FOR AN IRONING PRESS
Olindo Baruffa, Thonex, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland
Filed Dec. 4, 1979, Ser. No. 100,229
Claims priority, application Switzerland, Jun. 18, 1979, 110502
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—25

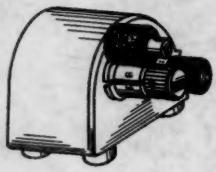


266,000
ELECTRIC REFRIGERATOR
Naoya Kawakami, Yono, Japan, assignor to Sawafuji Electric Co., Ltd., Japan
Filed Feb. 29, 1980, Ser. No. 125,835
Claims priority, application Japan, Sep. 11, 1979, 54-38415
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D15—88



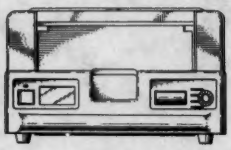
266,001
ROTARY TOOL HOLDER
Zeev Wertheimer, Nahariya, Israel, assignor to Iscar Ltd., Nahariya, Israel
Filed May 22, 1980, Ser. No. 152,427
Claims priority, application Israel, Nov. 30, 1979, 7778; Dec. 19, 1979, 7790
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—140

266,002
FILM REPAIR APPARATUS
James S. Stanfield, 1044 19th St., Santa Monica, Calif. 90403, and Daniel E. Rodriguez, 1065 E. Concha St., Altadena, Calif. 91001
Filed Oct. 23, 1979, Ser. No. 87,535
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—41



266,003
GUITAR
Thomas G. Lieber, Valley Stream, N.Y., assignor to Spellbinder Inc., New York, N.Y.
Filed Jan. 22, 1980, Ser. No. 114,223
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—14

266,004
PAPER SHEET COUNTER
Hiroyuki Onda, and Kenji Ishibashi, both of Tokyo, Japan, assignors to Musashi Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 1, 1979, Ser. No. 44,464
Claims priority, application Japan, Dec. 13, 1978, 53-52316
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D18—3

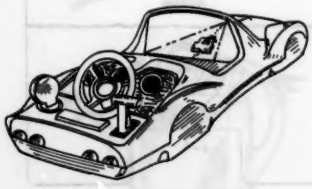


266,005
CALCULATOR KEYBOARD MODULE
Myron Beitler, West Orange, and John N. Johnston, North Plainfield, both of N.J., assignors to Litton Business Systems, Inc., Morris Plains, N.J.
Filed May 18, 1979, Ser. No. 40,133
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7

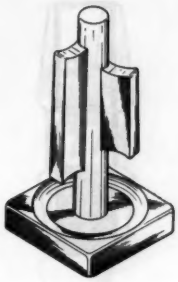
266,006
TYPEFACE
Georgia L. M. Roulo, 2650 N. Lakeview Ave., Chicago, Ill. 60614
Filed Jan. 30, 1980, Ser. No. 116,870
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D18—24

266,007
BALLPOINT PEN
Jerome P. Salinger, Roslyn, N.Y., assignor to Jonathan Bradley Pens, Inc., Long Island City, N.Y.
Filed Jun. 9, 1980, Ser. No. 158,051
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—42

266,008
TOY DRIVING SIMULATOR
Ronald R. Klawitter, Hermann, Mo., assignor to Steven Manufacturing Company, Hermann, Mo.
Filed Jan. 3, 1980, Ser. No. 109,240
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—63

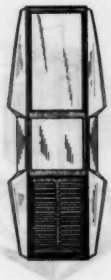


266,009
DESK ACCESSORY FOR HOLDING RUBBER BANDS AND PAPER CLIPS AND THE LIKE
Shirley Carney, 7012 Wakefield, Dallas, Tex. 75231
Filed Sep. 3, 1980, Ser. No. 183,850
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—75



266,010
GOLF GAME TARGET
Donald G. Cofer, Simons Island, Ga., assignor to Cofer and Fitzgerald, Simons Island, Ga.
Filed Dec. 5, 1979, Ser. No. 100,362
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—8

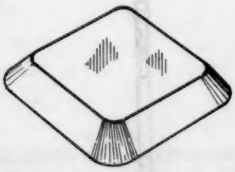
266,011
ELECTRONIC GAME HOUSING
Kathleen A. Holland, Wakefield, Mass., assignor to CPG Products Corp., Beverly, Mass.
Filed Feb. 7, 1980, Ser. No. 119,357
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13



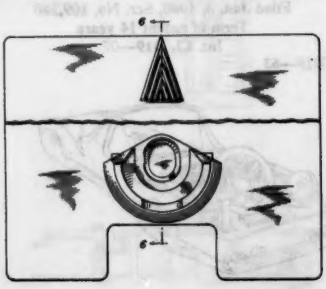
266,012
SET OF CHESS PIECES
Mingder Shyu, 3105 Kipling Pl., Fremont, Calif. 94536
Filed Oct. 4, 1979, Ser. No. 81,630
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—52

266,013
GAME TARGET
Floyd F. Perry, P. O. Box 217, and Donald L. Farnsworth, 1142 Uplands Dr., both of El Dorado Hills, Calif. 95630
Filed May 8, 1980, Ser. No. 147,744
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—5

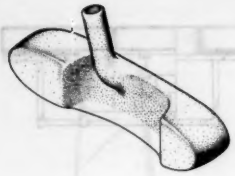
266,014
AERIAL TOY
Dennis D. Wittman, 1319 Eastwood Ave., Akron, Ohio 44305
Filed Apr. 24, 1978, Ser. No. 899,645
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—86



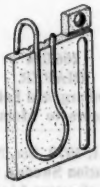
266,015
COMBINED FOOTBALL KICKER'S PRACTICE MAT AND AUXILIARY TEE
John C. Patton, 1460 Tulane, Vidor, Tex. 77662
Filed Jul. 23, 1979, Ser. No. 59,672
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—209



266,016
GOLF PUTTER HEAD
Charles A. Sanna, 909 Farwell Dr., Madison, Wis. 53704
Filed May 12, 1980, Ser. No. 149,293
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—217



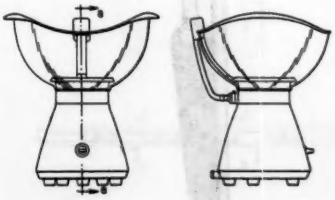
266,017
WATERING CAN
Harlan F. Kellogg, 1617 Sprucewood, Rockford, Ill. 61107
Filed Feb. 7, 1980, Ser. No. 119,302
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—11



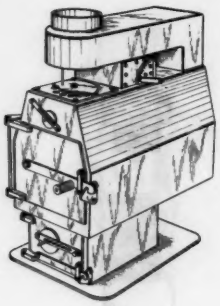
266,018
WATERING CAN
Richard D. Dilyard, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Mar. 26, 1982, Ser. No. 247,719
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—11

266,019
PROPANE TANK SAFETY PRESSURE VENT VALVE
Raymond R. Crossman, 2796 Wissemann Dr., Sacramento, Calif. 95816
Filed Feb. 19, 1980, Ser. No. 122,595
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

266,020
FACE WASHER
Toshio Mikiya, and Tadahisa Mogaki, both of Tokyo, Japan, assignors to Nikki Co., Ltd., Tokyo, Japan
Filed May 22, 1979, Ser. No. 41,506
Claims priority, application Japan, Nov. 28, 1978, 53-50071
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—48

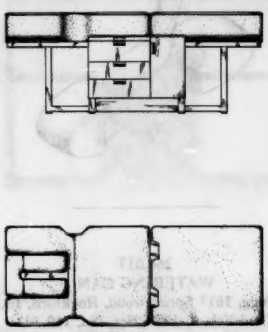


266,021
WOOD BURNING STOVE
Peter Kilham, P.O. Box 98, Pole 27, Mill Rd., Foster, R.I. 02825
Filed Apr. 21, 1980, Ser. No. 142,110
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



266,022
HEAT EXCHANGER
Thomas R. Carruthers, Glasgow, Scotland, assignor to Fleming Fabrications Limited, Glasgow, Scotland
Filed Feb. 16, 1979, Ser. No. 12,736
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—136

266,023
COMBINED TREATMENT TABLE AND CABINET ASSEMBLY
Walter A. McLachlan, P.O. Box 1783, Gimli, Manitoba, Canada
Filed Jun. 19, 1978, Ser. No. 907,245
Term of patent 14 years
Int. Cl. 24—*01*; 6—*04*
U.S. Cl. D24—3



266,024
DIAPER
Maj I. Ternström, Gothenburg, and Leif R. U. Widlund, Pixbo, both of Sweden, assignors to Molnlycke AB, Gothenburg, Sweden
Filed Dec. 31, 1979, Ser. No. 108,695
Claims priority, application Sweden, Jul. 2, 1979, 791588
Term of patent 14 years
Int. Cl. D24—*04*; D2—*01*
U.S. Cl. D24—50

266,025

HIGH-INTENSITY DISCHARGE LAMP

Elmer N. Polhemus, Summit, N.J., and Theodore C. Retzer, Richardson, Tex., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 13, 1979, Ser. No. 93,325

Term of patent 14 years

Int. Cl. D26—*04*

U.S. Cl. D26—2

266,026

FLUORESCENT LAMP

Kazuo Ariga, and Youichiro Akanuma, both of Tokyo, Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Dec. 4, 1979, Ser. No. 100,138

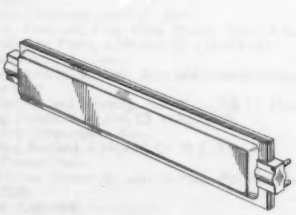
Claims priority, application Japan, Feb. 20, 1979, 54-6030

The portion of the term of this patent subsequent to May 1, 1993, has been disclaimed.

Term of patent 14 years

Int. Cl. D26—*04*

U.S. Cl. D26—3



266,027

MOTORCYCLE HEADLIGHT BOOT

Charles A. Saunders, IV, P.O. Box 1246, Columbus, Nebr. 68601

Filed Mar. 12, 1979, Ser. No. 19,885

Term of patent 14 years

Int. Cl. D26—*99*

U.S. Cl. D26—139

266,028

ILLUMINATED MIRROR CASE

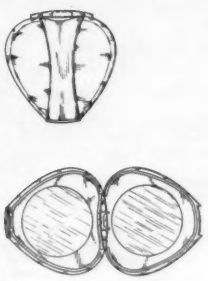
Raymond Boyd, 2235 Cambridge Rd., Broomall, Pa. 19008

Filed Apr. 30, 1980, Ser. No. 144,977

Term of patent 14 years

Int. Cl. D28—*03*

U.S. Cl. D28—82



266,029

CHAIN FOR WASTE REMOVAL CONVEYOR FOR A BARN

Seizaburo Fujisawa, Suzaka, Japan, assignor to Orion Machinery Co., Ltd., Nagano, Japan

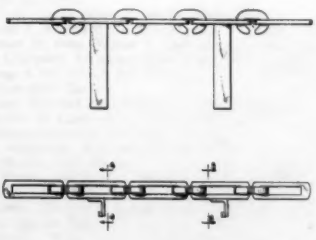
Filed Dec. 4, 1979, Ser. No. 99,992

Claims priority, application Japan, Nov. 13, 1978, 53-47884

Term of patent 14 years

Int. Cl. D08—*99*

U.S. Cl. D34—29



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 31ST DAY OF AUGUST, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A-T-O Inc.: *See*—
Latina, Roland N., 4,346,481, Cl. 2-19.000.

Abbott Laboratories: *See*—
Chu, Daniel T., 4,347,355, Cl. 542-420.000.

Abbott, Ned E.; Keshavan, Hampapur R.; and McGuire, Robert J., to Rockwell International Corporation. Monitored muldem with self test of the monitor. 4,347,600, Cl. 370-13.000.

Abdo, Milton K., to Mobil Oil Corporation. Oil recovery process employing a non-ionic glucan in combination with clay flocculant. 4,347,146, Cl. 252-8.55D.

Abe, Kunio; Saito, Masatsugu; Ono, Masao; and Ikedo, Yuji, to Pioneer Electronic Corporation. Disc player apparatus. 4,347,596, Cl. 369-72.000.

Abe, Ryutaro: *See*—
Shiozawa, Shookichi; Nakayama, Tomomi; Haga, Kyosuke; Abe, Ryutaro; and Takeuchi, Yoshiyuki, 4,347,047, Cl. 417-310.000.

Abex Corporation: *See*—
Frank, Earl E., 4,346,751, Cl. 164-368.000.
Frank, Earl E., 4,346,785, Cl. 184-3.00A.

Accursi, James F.: *See*—
Cheong, Alex S.; and Accursi, James F., 4,346,757, Cl. 165-51.000.

ACF Industries, Incorporated: *See*—
Ware, Don A.; Coughlin, Steve A.; and Whatley, Oscie B., 4,347,426, Cl. 219-125.100.

Adachi, Hiromi, to Mitsubishi Denki Kabushiki Kaisha. Discharge lamp lighting device. 4,347,462, Cl. 315-290.000.

Adams, Les: *See*—
Raynor, Roger F.; and Adams, Les, 4,346,815, Cl. 220-306.000.

Adams, Richard E.; and Stafford, Richard W., to Emhart Industries, Inc. Coil assembly. 4,347,493, Cl. 336-192.000.

Aerco International, Inc.: *See*—
Cohen, Kenneth W.; and Mansey, George P., 4,346,759, Cl. 165-163.000.

AFA Consolidated Corporation: *See*—
Wesner, Walter H.; and Wallace, Fred E., 4,346,821, Cl. 222-153.000.

Afonso, Adriano; and Hon, Frank, to Schering Corporation. Process for the synthesis of penems and carbapenems. 4,347,183, Cl. 260-245.20R.

Afzelius, Raoul: *See*—
Knudsen, Niels; Orpana, Veikko; Wisur, Matti; Warulf, Olov; Bergqvist, Hakan; and Afzelius, Raoul, 4,347,401, Cl. 174-14.00R.

Agdanowski, Ronald T.; and Schuessler, Thomas F., to Sherwood Medical Industries Inc. Body fluid collection device with disposable liner. 4,346,711, Cl. 128-276.000.

Agence Nationale de Valorisation de la Recherche: *See*—
Doyen, Joel; and Raisin, Jean-Pierre, 4,346,877, Cl. 271-19.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Potier, Pierre; Langlois, Nicole; Langlois, Yves; Andriamialisoa, Ratremaniaina Z.; and Mangeney, Pierre, 4,347,249, Cl. 424-262.000.

Agency of Industrial Science and Technology: *See*—
Kitaoka, Yoji; Hirato, Mizuho; and Miyatani, Kazuo, 4,347,223, Cl. 422-242.000.
Nagaoka, Kinnosuke; Kato, Tsumugu; and Nozawa, Mitsuru, 4,347,072, Cl. 65-27.000.
Osumi, Yasuaki; Suzuki, Hiroshi; Kato, Akihiko; and Nakane, Masanori, 4,347,082, Cl. 75-171.000.

Agey, Davis M., III. Liquid diverting coin hopper. 4,346,798, Cl. 194-1.00K.

AGFA-Gevaert AG: *See*—
Geisslinger, Wolfgang; Pustka, Karel; Bronner, Hermann; Mullritter, Ludwig; and Vondrowski, Gabriel, 4,346,616, Cl. 192-84.00C.

Agfa-Gevaert Aktiengesellschaft: *See*—
Pohler, Friedmar; Falk, Hans; Muller, Josef; Klein, Hans J.; and Hoffacker, Franz, 4,346,668, Cl. 118-665.000.

Agip Nucleare S.p.A.: *See*—
Bezzi, Giovanni; Pauluzzi, Ego; and Zanardi, Mauro, 4,347,200, Cl. 264-9.000.

Ahlen, Karl G.; and Norberg, Nils A., to S.R.M. Hydromekanik Aktiebolag. Pumps. 4,347,044, Cl. 417-253.000.

Air O Scoop Corporation: *See*—
Chatlos, Richard, 4,346,648, Cl. 98-2.120.

Airhart, Forrest: *See*—
De Haven, Vernet F.; and Airhart, Forrest, 4,346,644, Cl. 89-37.00B.

Aisin Seiki Kabushiki Kaisha: *See*—
Hayashi, Masaharu; and Tsuchikawa, Sunzo, 4,347,038, Cl. 416-132.00A.
Inada, Masami; Ohumi, Takeharu; and Hashimoto, Kenji, 4,346,736, Cl. 137-625.480.

Aisin-Warner K.K.: *See*—
Kawamoto, Mutsumi, 4,346,626, Cl. 74-866.000.
Kawamoto, Mutsumi; and Miki, Nobuaki, 4,346,627, Cl. 74-869.000.

Aizawa, Masahiro, to Ricoh Company, Ltd. Sheet feeding apparatus. 4,346,878, Cl. 271-118.000.

Ajinomoto Company, Incorporated: *See*—
Miwa, Kiyoshi; Tsuchida, Takayasu; Kurahashi, Osamu; Nakamori, Shigeru; Sano, Konosuke; and Momose, Haruo, 4,347,318, Cl. 435-115.000.
Yoshimura, Minoru; Takenaka, Yoshihiro; Ikeda, Shigeho; and Yoshii, Hiroe, 4,347,317, Cl. 435-110.000.

Akerberg, Dag, to Telefonaktiebolaget L M Ericsson. Installation for transmitting alarm signals. 4,347,501, Cl. 340-539.000.

Akimune, Yoshio: *See*—
Kimura, Shinji; Takao, Hiroshi; Ambe, Satoshi; and Akimune, Yoshio, 4,347,114, Cl. 204-195.00S.

Akiyama, Susumu; Ito, Kenzo; Fukaya, Hiroyasu; Ogiso, Haruhiko; Hirabayashi, Yuji; and Kawamura, Takahide, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Method and apparatus for controlling ignition coil energization. 4,347,570, Cl. 364-431.040.

Aktieselskabet de Danske Sukkerfabrikker: *See*—
Madsen, Rud F.; Nielsen, W. Kofod; and Hansen, Ole, 4,347,061, Cl. 44-51.000.

Akutagawa, Susumu; and Taketomi, Takanao, to Takasago Perfumery Co., Ltd. Process for preparing hydroxycitronellal. 4,347,387, Cl. 568-450.000.

Akzona Incorporated: *See*—
Van Drumpt, Jan D.; and Beijleveld, Wilhelmus M., 4,347,342, Cl. 525-374.000.

Albert-Frankenthal, AG: *See*—
Schwaab, Manfred; Puschnerat, Helmut; and Storz, Kurt, 4,346,656, Cl. 101-181.000.

Albertassi, James H.; Heinze, Walter O.; and Landsman, Aaron, to International Water Saving Systems, Inc. Effluent treatment in a non-polluting toilet system. 4,347,142, Cl. 210-756.000.

Albertson, Orris E.: *See*—
Lombana, Luis A.; Myers, Daniel E.; and Albertson, Orris E., 4,347,156, Cl. 252-420.000.

Albertson, Walter: *See*—
Hass, Robert H.; and Albertson, Walter, 4,347,227, Cl. 423-235.000.

Alco Foodservice Equipment Company: *See*—
Jones, Frank W., 4,346,634, Cl. 83-431.000.

Alexander, Donald J.: *See*—
Sindelar, Robert A.; and Alexander, Donald J., 4,347,016, Cl. 404-95.000.

Alf Hannaford & Co. Pty. Limited: *See*—
Crompton, Alan W., 4,347,260, Cl. 426-483.000.

Alfred Schmidt, GmbH: *See*—
Schmidt, Alfred, 4,346,527, Cl. 37-250.000.

Allain, Ronald J.; and Fong, Dodd W., to Nalco Chemical Company. Process for preparing overbased magnesium sulfonates. 4,347,147, Cl. 252-33.300.

Allegretti & Company: *See*—
Mattson, Charles A.; and Michel, James J., 4,346,526, Cl. 37-259.000.

Allen, John J., Jr.; and Shute, Bruce W., to General Signal Corporation. Wheel slip system. 4,347,569, Cl. 364-426.000.

Allen, Perrin A.: *See*—
Lau, Charles R.; Jensen, William; and Allen, Perrin A., 4,347,280, Cl. 428-304.400.

Allen, Roger E.: *See*—
Esterowitz, Leon; Allen, Roger E.; Kruer, Melvin R.; and Bartoli, Filbert J., 4,347,485, Cl. 372-42.000.

Alley, Robert P.; Pohl, Walter J.; and Relyea, John W., to General Electric Company. Two stage control circuit for reversible air cycle heat pump. 4,346,755, Cl. 165-17.000.

Allied Corporation: *See*—
Sweeney, Edmund F., 4,347,512, Cl. 343-6.50R.

Allison, Robert B. Lawn mower. 4,346,547, Cl. 56-13.600.

Alloy Surfaces Company, Inc.: *See*—
Baldi, Alfonso L., 4,347,267, Cl. 427-237.000.

Alps Electric Co., Ltd.: *See*—
Ohta, Shigeo; and Suzuki, Takeo, 4,347,482, Cl. 330-298.000.

Alsthom-Atlantique: *See*—
Condolios, Elie; and Couratin, Pierre, 4,347,140, Cl. 210-710.000.

Altenheiner, Erwin: *See*—
Lehrmund, Willi; and Altenheiner, Erwin, 4,346,960, Cl. 350-76.000.

Alter, Larry D., to E-Systems, Inc. Adaptive array processor and processing method for communication system. 4,347,627, Cl. 455-136.000.

ALZA Corporation: *See—*
Schmitt, Edward E., 4,346,709, Cl. 128-260.000.

Ambe, Satoshi: *See—*
Kimura, Shinji; Takao, Hiroshi; Ambe, Satoshi; and Akimune, Yoshio, 4,347,114, Cl. 204-195.00S.

Amchem Products, Inc.: *See—*
Nishida, Takao; and Hirohata, Takashi, 4,347,172, Cl. 524-319.000.

Amdahl Corporation: *See—*
Price, John E., 4,347,446, Cl. 307-443.000.

American Can Company: *See—*
Knott, Jack E., II, 4,347,337, Cl. 525-60.000.
Odorzynski, Thomas W.; and Knott, Jack E., II, 4,347,332, Cl. 524-169.000.
Rentmeester, Kenneth R., 4,346,814, Cl. 220-75.000.

American Cyanamid Company: *See—*
Joseph, Joseph P.; Dusza, John P.; and Bernstein, Seymour, 4,347,251, Cl. 424-263.000.
Wright, William B., Jr.; Tomcufcik, Andrew S.; and Marsico, Joseph W., Jr., 4,347,248, Cl. 424-251.000.

American Home Products Corporation: *See—*
Bell, Stanley C., 4,347,362, Cl. 546-123.000.

American Safety Equipment Corporation: *See—*
Hollowell, William M.; and Ziv, Avraham, 4,346,858, Cl. 242-107.000.

AMF Incorporated: *See—*
Southall, Kenneth, 4,347,208, Cl. 264-229.000.

AMP Incorporated: *See—*
Bright, Edward J.; Kaplon, David A.; and Scheingold, William S., 4,346,952, Cl. 339-17.0CF.

Ampex Corporation: *See—*
Fechner, Erno H., 4,347,549, Cl. 361-212.000.

Anchor/Darling Industries, Inc.: *See—*
Sulzer, Harry E., 4,346,728, Cl. 137-243.609.

Anders, Dietmar, to Hermann Berstorff Maschinenbau GmbH. Two-stage extruder. 4,347,003, Cl. 366-75.000.

Anderson, Ardis L.; and McConaghy, James R., to Conoco Inc. Upgrading of heavy hydrocarbons. 4,347,120, Cl. 208-50.000.

Anderson, Edward P.; and Curran, Donald G., to Bunnell Plastics, Inc. Process for forming laminated pipe. 4,347,090, Cl. 156-149.000.

Anderson, Gary B., to Antroy Enterprises, Inc. Device for controlling a circuit. 4,347,505, Cl. 340-666.000.

Anderson, George H.: *See—*
Bauman, Richard F.; Taunton, John W.; Anderson, George H.; Trachte, Ken L.; and Hsia, Steve J., 4,347,117, Cl. 208-8.0LE.

Anderson, John M. Balance hydraulic pumping unit. 4,347,049, Cl. 417-403.000.

Anderson, Leif. Device relating to building frameworks. 4,346,540, Cl. 52-274.000.

Anderson, Philip A., to Outboard Marine Corporation. CD Ignition with isolation circuit to provide immediate recharging of the charge capacitor. 4,346,690, Cl. 123-599.000.

Ando, Hiroyuki, to Kabushiki Kaisha Komatsu Seisakusho. Apparatus for manufacturing fittings. 4,346,581, Cl. 72-347.000.

Andriamialisoa, Ratremaniaina Z.: *See—*
Potier, Pierre; Langlois, Nicole; Langlois, Yves; Andriamialisoa, Ratremaniaina Z.; and Mangeney, Pierre, 4,347,249, Cl. 424-262.000.

Angehrn, Jorg A.: *See—*
Howells, Anthony P. S.; Viswanathan, Raman; and Angehrn, Jorg A., 4,346,593, Cl. 73-152.000.

Anic, S.p.A.: *See—*
Giusti, Paolo, 4,347,340, Cl. 525-249.000.

Annoni, Eliseo: *See—*
Stefanoni, Romano; and Annoni, Eliseo, 4,346,853, Cl. 242-58.100.

Anstalt Mura: *See—*
Posch, Oskar, 4,347,218, Cl. 422-151.000.

Antroy Enterprises, Inc.: *See—*
Anderson, Gary B., 4,347,505, Cl. 340-666.000.

Aoki, Hiroshi: *See—*
Nakahara, Tsunamitsu; Aoki, Hiroshi; and Kurisu, Toru, 4,346,947, Cl. 308-9.000.

Aoki, Osamu: *See—*
Isshiki, Tomiya; Tomita, Tetsuo; Sakaguchi, Shuzabu; Kohzaki, Toshiaki; Aoki, Osamu; Takeda, Norio; and Aoki, Yoshiyuki, 4,347,383, Cl. 564-249.000.

Aoki, Yoshiyuki: *See—*
Isshiki, Tomiya; Tomita, Tetsuo; Sakaguchi, Shuzabu; Kohzaki, Toshiaki; Aoki, Osamu; Takeda, Norio; and Aoki, Yoshiyuki, 4,347,383, Cl. 564-249.000.

Aotsuka, Kazuo: *See—*
Mukuda, Mutsuo; Murakami, Masahiro; and Aotsuka, Kazuo, 4,347,421, Cl. 219-60.00A.

Appiano, Silvano; Di Pino, Duccio; and Poggio, Cesare, to CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A. Self-checking system for electronic processing equipment. 4,347,608, Cl. 371-16.000.

Applied Engineering, Inc.: *See—*
Merritt, John H., Jr., 4,346,674, Cl. 122-390.000.

Appling, James, to Bendix Corporation, The. Connector for elongated underwater towed array. 4,346,954, Cl. 339-89.00M.

Arai, Sakuji: *See—*
Noritake, Yutaka; Kajitani, Ikuo; Arai, Sakuji; and Muto, Toshiaki, 4,347,219, Cl. 422-180.000.

Arakawa, Fumio, to Pioneer Electronic Corporation. Tone arm assembly. 4,347,598, Cl. 369-254.000.

Arakawa, Tatsumi: *See—*
Shiga, Tetsuo; Ozaki, Masaru; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, 4,347,310, Cl. 430-620.000.

Arbed S.A.: *See—*
Goedert, Jean, 4,347,078, Cl. 75-51.000.
Metz, Paul, 4,347,019, Cl. 405-255.000.

Ares, Inc.: *See—*
De Haven, Vernet F.; and Airhart, Forrest, 4,346,644, Cl. 89-37.00B.

Arima, Hideo: *See—*
Tosaki, Hiromi; Arima, Hideo; Mozume, Teruo; Ikegami, Akira; Isogai, Tokio; and Tsubokawa, Ichiro, 4,347,166, Cl. 252-519.000.

Armco Inc.: *See—*
Haselkorn, Michael H.; and Loudermilk, Dannie S., 4,347,085, Cl. 148-6.160.

Armour and Company: *See—*
Orlowski, Gerald J.; and Dugle, Thomas, 4,346,654, Cl. 100-268.000.

Armstrong World Industries: *See—*
McLaughlin, Albert J.; and Paddison, Gary W., 4,346,599, Cl. 73-597.000.

Arnold, Lee. Fluid energy converting method and apparatus. 4,347,036, Cl. 416-1.000.

Arpin, John. Penetrating compositions for wet removal of friable insulation materials. 4,347,150, Cl. 252-135.000.

Asada, Kikuo, to Usui Kokusai Sangyo Kabushiki Kaisha. Composite metal tubing. 4,346,739, Cl. 138-143.000.

Asahi-Dow Limited: *See—*
Iwami, Isamu; Kimura, Shingo; and Iwasa, Toshio, 4,347,326, Cl. 501-39.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Shiga, Tetsuo; Ozaki, Masaru; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, 4,347,310, Cl. 430-620.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Komoto, Shinsuke; and Sekiguchi, Tetsuo, 4,346,967, Cl. 350-430.000.

Asano, Hiroaki; Ota, Hiroshi; and Yamakage, Kenji, to Toyoda Koki Kabushiki Kaisha. Cam grinding machine. 4,346,535, Cl. 51-101.00R.

Asano, Masaya; Mori, Yoichi; and Takayama, Yoshiaki, to Toray Industries, Inc. Dry planographic printing plate with organic acid additive. 4,347,303, Cl. 430-272.000.

ASEA Aktiebolag: *See—*
Ullin, Ulf, 4,347,475, Cl. 323-303.000.

Ash, Christopher P., to Plessey Overseas Limited. Transversal equalizers. 4,347,615, Cl. 375-14.000.

Ashland Oil, Inc.: *See—*
Myers, George D.; and Busch, Lloyd E., 4,347,122, Cl. 208-113.000.

Atkinson, Cecil G. Attachment for a harvester for picking up downed corn stalks. 4,346,548, Cl. 56-119.000.

Atlantic Richfield Company: *See—*
Schelhas, Peter; and Schlott, Walter, 4,347,026, Cl. 411-299.000.

Aubourg, Patrick F.; and Propster, Mark A., to Owens-Corning Fiberglas Corporation. Method of producing glass from agglomerates which include organic coated scrap glass. 4,347,073, Cl. 65-28.000.

Audeh, Costandi A.; and Greco, Saverio G., to Mobil Oil Corporation. Method for treating alkaline effluents resulting from petroleum processing. 4,347,225, Cl. 423-207.000.

Audeh, Costandi A.; and Greco, Saverio G., to Mobil Oil Corporation. Method for treating sulfur-containing effluents resulting from petroleum processing. 4,347,226, Cl. 423-207.000.

Audi NSU Auto Union Aktiengesellschaft: *See—*
Bauder, Armin, 4,346,687, Cl. 123-454.000.

Autologic, S.A.: *See—*
Moyroud, Louis M., 4,346,969, Cl. 354-7.000.

Automated Energy Systems, Inc.: *See—*
Griffin, William T., 4,346,621, Cl. 74-665.00G.

Automatic Pipe Racker, Inc.: *See—*
Dugan, Charles D., 4,347,028, Cl. 414-22.000.

Automotive Products Limited: *See—*
Parsons, David, 4,346,573, Cl. 70-264.000.

Ayukawa, Yukitada: *See—*
Ueno, Hitoshi; Yazaki, Shirokazu; and Ayukawa, Yukitada, 4,346,950, Cl. 312-138.00R.

B. F. Goodrich Company, The: *See—*
Lai, John T., 4,347,379, Cl. 562-495.000.
Landsness, Clifford A.; and Buehrle, Thomas M., 4,347,477, Cl. 324-54.000.
Martindale, Troy E., 4,346,506, Cl. 29-239.000.

Badke, Frank C. Putting golf ball. 4,346,898, Cl. 273-232.000.

Baehr, Burghard: *See—*
Gemma, Mario; and Baehr, Burghard, 4,346,564, Cl. 62-140.000.

Bagoy, John P.; and Riendl, Joseph A. Traction device for vehicles. 4,346,748, Cl. 152-222.000.

Bahl, Surinder K.; and Schutrum, Walter L., to Mead Corporation, The. Laminated metal charge plate. 4,347,522, Cl. 346-75.000.

Bailey, August V.; Boudreaux, Gordon J.; and Sumrell, Gene, to United States of America, Agriculture. Antimicrobial glycolic acid derivatives. 4,347,378, Cl. 560-105.000.

Bailey, John M., to Caterpillar Tractor Co. Method for flattening corrugated heat exchanger plates. 4,346,582, Cl. 72-379.000.

Baird, William C., Jr.: *See—*
Mauldin, Charles H.; and Baird, William C., Jr., 4,347,123, Cl. 208-136.000.

Baker Perkins Holdings Ltd.: *See—*
Bennett, John D.; Holmes, Brian; and Morton, David C., 4,346,800, Cl. 198-412.000.

Baker, Rees T. K.: *See—*
Sherwood, Rexford D.; Baker, Rees T. K.; Derouane, Eric G.; and Pieters, Wim J., 4,347,063, Cl. 48-197.00R.

Baker, Richard H., to Exxon Research and Engineering Co. Floating hybrid switch. 4,347,445, Cl. 307-255.000.

Baker, Robert J.: *See—*
Smith, Verity C.; Baker, Robert J.; Barrow, Wyile W., Jr.; and Doane, H. Daniel, 4,346,923, Cl. 285-340.000.

Baldi, Alfonso L., to Alloy Surfaces Company, Inc. Diffusion coating through restrictions. 4,347,267, Cl. 427-237.000.

Bambozzi, Bruno. Variable three-phase inductor. 4,347,489, Cl. 336-10.000.

Bandoh, Kazuo. Process and apparatus for molding plastics. 4,347,211, Cl. 264-297.000.

Banich, John N., Sr., to Continental Group, Inc., The. Plastic closure with reinforced central panel. 4,346,812, Cl. 215-352.000.

Banos, Jean; Cantagrel, Jean-Claude; Cahuzac, Georges; and Darrieux, Jean-Louis, to Societe Nationale Industrielle et Aerospatiale. Three-dimensional woven articles. 4,346,741, Cl. 139-387.00R.

Barlow, Gordon A.; and Krutsch, John R., to Gordon Barlow Design. Board game with path creating tiles for vehicle. 4,346,889, Cl. 273-1.0GA.

Barnscheidt, Wolfgang, to Feldmuhle Aktiengesellschaft; and E. & M. Lamort S.A. Flotation apparatus for de-inking pulp suspensions. 4,347,128, Cl. 209-170.000.

Baron, Gerhard: *See—*
Reh, Lothar; Hirsch, Martin; Baron, Gerhard; Blaum, Eberhard; and Hafke, Carl, 4,347,064, Cl. 48-197.00R.

Barrow, Wyile W., Jr.: *See—*
Smith, Verity C.; Baker, Robert J.; Barrow, Wyile W., Jr.; and Doane, H. Daniel, 4,346,923, Cl. 285-340.000.

Bartl, Herbert; and Schuster, Klaus, to Bayer Aktiengesellschaft. Process for the production of ethylene graft copolymers containing anhydride or carboxyl groups. 4,347,341, Cl. 525-267.000.

Bartoli, Filbert J.: *See—*
Esterowitz, Leon; Allen, Roger E.; Kruer, Melvin R.; and Bartoli, Filbert J., 4,347,485, Cl. 372-42.000.

Barwick, Elvin F.: *See—*
Long, Z. Vance; and Barwick, Elvin F., 4,346,843, Cl. 239-199.000.

BASF Aktiengesellschaft: *See—*
Gramlich, Walter; Hoffmann, Werner; Hupfer, Leopold; Meissner, Bernd; and Paetsch, Juergen, 4,347,388, Cl. 568-840.000.
Hauck, Karl; Fehrenbach, Hubert; Mayer, Dieter; Wagner, Herbert; and Zwintzscher, Kurt, 4,347,091, Cl. 156-217.000.
Schoettle, Klaus; Dobler, Peter; Gliniorz, Lothar; and Hoffmann, Werner, 4,347,537, Cl. 360-132.000.

BASF Wyandotte Corporation: *See—*
Demou, John G.; Pray, Edward R.; and McBrayer, Robert L., 4,347,330, Cl. 521-110.000.

Basiulis, Algerd: *See—*
Taylor, Peter F.; Tuchyner, Harold J.; Basiulis, Algerd; and Lamp, Thomas R., 4,346,643, Cl. 89-14.100.

Bass, Edmund P.; and Sharpee, Richard L., to Norden Laboratories, Inc. Inactivated rabies vaccine for veterinary use. 4,347,239, Cl. 424-89.000.

Batdorf, Vernon H., to H. B. Fuller Company. Curable aqueous silicate composition, uses thereof, and coatings or layers made therefrom. 4,347,285, Cl. 428-332.000.

Batemou, Robert F.: *See—*
Cho, Kazunobu; Beauchamp, Roger P.; and Batemou, Robert F., 4,346,813, Cl. 220-22.000.

Battigelli, Jean A.: *See—*
Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, 4,347,070, Cl. 65-9.000.

Bauder, Armin, to Audi NSU Auto Union Aktiengesellschaft. Fuel injection systems. 4,346,687, Cl. 123-454.000.

Baum, Kurt; Bedford, Clifford D.; and Hunadi, Ronald O., to Fluorchem Inc. Method of making and polymerizing perfluoroalkylene acetylene compounds. 4,347,376, Cl. 556-466.000.

Bauman, Richard F.; Taunton, John W.; Anderson, George H., Trachte, Ken L.; and Hsia, Steve J., to Exxon Research & Engineering Co. Donor solvent coal liquefaction with bottoms recycle at elevated pressure. 4,347,117, Cl. 208-8.0LE.

Bauman, William C.: *See—*
Lee, John M.; and Bauman, William C., 4,347,327, Cl. 521-28.000.

Baumann, David L.; and Meismer, Richard A., to Caterpillar Tractor Co. Reboring fixture and method. 4,346,508, Cl. 29-402.180.

Baumann, Otto S.: *See—*
Jeromin, Lothar S.; Geddes, Glenn F.; Baumann, Otto S.; and Santoro, Joseph F., 4,346,983, Cl. 355-3.00R.

Baxter Travenol Laboratories, Inc.: *See—*
Dennehey, T. Michael; Greff, Richard J.; and Wolf, Ludwig, Jr., 4,346,703, Cl. 128-213.00A.
Kulle, Lee K., 4,346,704, Cl. 128-214.00R.
Pekkarinen, Michael O.; and Shim, Norm, 4,346,705, Cl. 128-214.00F.

Bayen, Jean; and Scemama, Patrick, to Pipeline Service. Method of drying pipelines and putting gas thereinto. 4,346,726, Cl. 137-15.000.

Bayer Aktiengesellschaft: *See—*
Bartl, Herbert; and Schuster, Klaus, 4,347,341, Cl. 525-267.000.
Dorlars, Alfons, 4,347,357, Cl. 542-462.000.

Bayerische Motoren Werke: *See—*
Mader, Reinhard, 4,346,682, Cl. 123-179.00G.

Bayerische Motoren Werke A.G.: *See—*
Weishaupt, Walter; and Fournell, Hans-Dieter, 4,347,545, Cl. 361-172.000.

BBC Brown, Boveri & Company Limited: *See—*
Zumstein, Bruno, 4,346,559, Cl. 60-606.000.

Beall, Glenn L.; and Noonan, Robert P., to Miles Laboratories, Inc. Gas generating apparatus for anaerobic atmosphere. 4,347,222, Cl. 422-211.000.

Beaney, Derek N.: *See—*
Russell, Leonard V.; and Beaney, Derek N., 4,346,896, Cl. 273-195.00A.

Beatrice Foods Co., Div. of Elgin Molded Plastics: *See—*
Lindner, Henry, 4,346,868, Cl. 248-475.00R.

Beau, Jean-Francois, to Societe Nationale Industrielle Aerospatiale. Rotor assembly provided with a bearing having virtually zero axial clearance. 4,346,949, Cl. 308-236.000.

Beau, Jean-Francois, to Societe Nationale Industrielle Aerospatiale. Process for making a magnetic armature of divided structure and armature thus obtained. 4,347,449, Cl. 310-42.000.

Beauchamp, Roger P.: *See—*
Cho, Kazunobu; Beauchamp, Roger P.; and Batemou, Robert F., 4,346,813, Cl. 220-22.000.

Beck, Harold K., to Halliburton Company. Hydraulic jarring tool. 4,346,770, Cl. 175-297.000.

Beck, Milton A., to Kline, Larry Harold. Anti-Jacknife device. 4,346,910, Cl. 280-432.000.

Beckert, Adolf F.; Winberg, Dennis G.; and Nowlin, Duane D., to Ecodyne Corporation. Chemical dispenser. 4,347,224, Cl. 422-277.000.

Beckman Instruments, Inc.: *See—*
Polito, Alan J.; and Bray, Kurtis R., 4,347,058, Cl. 23-230.00B.
Polito, Alan J.; and Bray, Kurtis R., 4,347,059, Cl. 23-230.00B.

Bedford, Clifford D.: *See—*
Baum, Kurt; Bedford, Clifford D.; and Hunadi, Ronald O., 4,347,376, Cl. 556-466.000.

Beecham Group Limited: *See—*
Cole, Martin; and Edmondson, Robert A., 4,347,314, Cl. 435-43.000.
Giddings, Peter J.; John, David I.; and Thomas, Eric J., 4,347,182, Cl. 260-245.20R.
Smale, Terence C., 4,347,181, Cl. 260-245.20T.

Beer, Douglas C.; and Jatzek, Horst J., to CAE Machinery Ltd. Wood waferizing apparatus. 4,346,744, Cl. 144-176.000.

Behrens, Dieter: *See—*
Hahn, Reinhard; and Behrens, Dieter, 4,347,084, Cl. 75-245.000.

Beijleveld, Wilhelmus M.: *See—*
Van Drumpt, Jan D.; and Beijleveld, Wilhelmus M., 4,347,342, Cl. 525-374.000.

Beitner, Shlomo, to Bipol Ltd. Thermoelectric device and process for making the same. 4,346,562, Cl. 62-3.000.

Bell & Howell Company: *See—*
Guenther, Kenneth L.; Kosner, Jerry J., Jr.: Erikson, Rolf B.; and Zemke, Edward H., 4,346,876, Cl. 271-11.000.

Bell, Stanley C., to American Home Products Corporation. 1-Alkyl-4-amino-3-(3-aminotriazolo)-1,8 naphthyridine-2-ones. 4,347,362, Cl. 546-123.000.

Bell Telephone Laboratories, Inc.: *See—*
Pearce, Charles W.; and Schmidt, Paul F., 4,347,431, Cl. 219-390.000.

Belrecolt S.A.: *See—*
Wattron, Albert; and Quirin, Michel, 4,346,549, Cl. 56-370.000.

Belshaw Bros., Inc.: *See—*
Wilke, Wilbur D.; Hodge, Archie A.; Belshaw, Thomas E.; and Hamblin, John R., 4,346,649, Cl. 99-337.000.

Belshaw, Thomas E.: *See—*
Wilke, Wilbur D.; Hodge, Archie A.; Belshaw, Thomas E.; and Hamblin, John R., 4,346,649, Cl. 99-337.000.

Ben-Gurion University of the Negev: *See—*
Raz, Zeev, 4,346,735, Cl. 137-606.000.

Benckiser-Knapsack GmbH: *See—*
Merkenich, Karl; Koch, Wilhelm; Glandorf, Kaete; Uhlmann, Gerd; and Scheurer, Guenther, 4,347,258, Cl. 426-334.000.

Bendix Corporation, The: *See—*
Appling, James, 4,346,954, Cl. 339-89.00M.
Leung, Chun-Keung; and Seitz, William R., 4,347,571, Cl. 364-431.080.
Taplin, Lael B., 4,346,776, Cl. 180-179.000.

Benedict, Frank L.: *See—*
Livers, Gerald D.; and Benedict, Frank L., 4,346,914, Cl. 280-735.000.

Benner, Timothy E., to RCA Corporation. Mesh assembly having reduced microphonics for a pick-up tube. 4,347,459, Cl. 313-383.000.

Bennett, John D.; Holmes, Brian; and Morton, David C., to Baker Perkins Holdings Ltd. Apparatus for turning over conveyed articles. 4,346,800, Cl. 198-412.000.

Berghoff, Gene M.: *See—*
Kubalak, Thomas P.; Berghoff, Gene M.; and Palmer, William J., 4,347,496, Cl. 340-52.00R.

Bergqvist, Hakan: *See—*
Knudsen, Niels; Orpana, Veikko; Wisur, Matti; Warulf, Olov; Bergqvist, Hakan; and Afzelius, Raoul, 4,347,401, Cl. 174-14.00R.

Bernard, Alain; and Bonnaterre, Raymond, to Saft-Societe des Accumulateurs Fixes et de Traction. Electric cell assembly with an alkaline electrolyte and current output wires. 4,347,292, Cl. 429-65.000.

Bernardi, Herbert; and von Aschwege, Gerd, to G.A.O. Gesellschaft fur Automation und Organisation mbH. Device for automatically shredding thin sheets. 4,346,851, Cl. 241-159.000.

Bernatowicz, Henry; and Schoenig, Frederick C., Jr., to General Electric Company. Signature surveillance of nuclear fuel. 4,347,622, Cl. 376-245.000.

Bernett, Thomas B., to Eaton Corporation. Thermal actuator with lock open feature. 4,346,558, Cl. 60-527.000.

Bernhardt, Daniel. Replaceable multiple seal package. 4,346,833, Cl. 229-43.000.

Bernstein, Seymour: *See*—
Joseph, Joseph P.; Dusza, John P.; and Bernstein, Seymour, 4,347,251, Cl. 424-263.000.

Berwick, James W., Jr.; Bleeg, Robert J.; and McFaddin, Vincent E., to Boeing Company, The. Method and apparatus for an aircraft climb-out guidance system. 4,347,572, Cl. 364-433.000.

Bezzi, Giovanni; Pauluzzi, Ego; and Zanardi, Mauro, to Agip Nucleare S.p.A. Method of producing microspheres by vibrations. 4,347,200, Cl. 264-9.000.

Bianchi, John E.; and Nichols, Richard D. E., to Bianchi Leather Products, Inc. Vestlike weapon carrier. 4,346,827, Cl. 224-206.000.

Bianchi Leather Products, Inc.: *See*—
Bianchi, John E.; and Nichols, Richard D. E., 4,346,827, Cl. 224-206.000.

Bianchi, Valerio: *See*—
Latsch, Reinhard; and Bianchi, Valerio, 4,346,625, Cl. 74-859.000.

Bibollet, Jean-Claude. Method for making a head of piolet. 4,346,628, Cl. 76-109.000.

Biggar, Elizabeth S.: *See*—
Biggar, Frank M., III, 4,346,855, Cl. 242-67.200.

Biggar, Frank M., III, to Biggar, Elizabeth S. Stripping method and apparatus for the processing of a continuous laminated web. 4,346,855, Cl. 242-67.200.

Binder, Hellmuth, to Daimler-Benz Aktiengesellschaft. Bi-modal mechanically trackable road vehicle with automatic axle latching mechanism. 4,346,659, Cl. 104-247.000.

Binggeser, Ernst: *See*—
Peters, Klaus-Jurgen; Krauss, Rudolf; and Binggeser, Ernst, 4,346,577, Cl. 72-129.000.

Bio-Systems Research, Inc.: *See*—
Lionelle, Joseph E.; Staffa, Jeffrey A.; and McCormick, William L., 4,347,321, Cl. 435-161.000.

Bipol Ltd.: *See*—
Beitner, Shlomo, 4,346,562, Cl. 62-3.000.

Birk, Manfred O.; Piesczek, Wolfgang A.; and Little, Brian E., to Hoechst Fibers Industries. Yarn forwarding and drawing apparatus. 4,346,504, Cl. 28-240.000.

Birkemeier, William P., to United States of America, Air Force. Troposcatter system antenna alignment. 4,347,514, Cl. 343-100.0CS.

Birmingham Bolt Company: *See*—
White, Claude C.; and Carr, Frederick, 4,347,020, Cl. 405-260.000.

Bishop & Associates, Incorporated: *See*—
Willis, John H.; and Heath, Trevor C., 4,347,071, Cl. 65-10.200.

Bitter, Istvan; Soos, Rudolf; Toth, Geza; Toke, Laszlo; and Szabo, Gabor, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T. Process for the preparation of polyhalogenphenyl carbamates. 4,347,377, Cl. 560-32.000.

Black, David H. A.; Pelletier, Georges H.; and Lee, Hing F., to Northern Telecom Limited. Method of and apparatus for regenerating a signal frequency in a digital signal transmission system. 4,347,620, Cl. 375-112.000.

Black & Decker Inc.: *See*—
Cox, Alan W.; and Rainey, Paul N., 4,346,886, Cl. 272-72.000.
Simpson, Frank F., 4,346,769, Cl. 173-118.000.

Blackmore, Phillip W.: *See*—
Wilson, Keith E.; and Blackmore, Phillip W., 4,346,543, Cl. 52-404.000.

Blanchard, Clayton H., to LRC Electronics, Inc. Connector for co-axial cable. 4,346,958, Cl. 339-177.00R.

Blaum, Eberhard: *See*—
Reh, Lothar; Hirsch, Martin; Baron, Gerhard; Blaum, Eberhard; and Hafke, Carl, 4,347,064, Cl. 48-197.00R.

Bleeg, Robert J.: *See*—
Berwick, James W., Jr.; Bleeg, Robert J.; and McFaddin, Vincent E., 4,347,572, Cl. 364-433.000.

Blizzard, Roy I.; and Martin, Thomas O., to PPG Industries, Inc. Method for making antimony trioxide powder. 4,347,060, Cl. 23-294.00R.

Blomley, Peter F., to International Standard Electric Corporation. Electronic telephone circuit. 4,347,407, Cl. 179-81.00R.

Blount, David H. Process for the production of broken-down organic lignin-cellulose silicate polymers. 4,347,345, Cl. 527-301.000.

Bluggel, Erwin; and Mainka, Wolfgang, to Volkswagenwerk Aktiengesellschaft. Automatic safety belt system. 4,346,778, Cl. 180-268.000.

Bodenbenner, Kurt; Perkow, Helmut; and Vollmuller, Helmut, to Hoechst Aktiengesellschaft. Process for the purification of effluent. 4,347,144, Cl. 210-761.000.

Boehringer, John R. Gas analyzer. 4,346,584, Cl. 73-23.000.

Boehringer Mannheim GmbH: *See*—
Proelss, Henning F., 4,347,313, Cl. 435-19.000.

Boeing Company, The: *See*—
Berwick, James W., Jr.; Bleeg, Robert J.; and McFaddin, Vincent E., 4,347,572, Cl. 364-433.000.
Porter, David R., 4,346,961, Cl. 350-96.160.

Boevink, Jan E.; Derrick, Arthur P.; and Moodie, John A., to Nalco Chemical Company. Cationic block copolymers. 4,347,339, Cl. 525-180.000.

Bohm, Robert. Method of producing an improved vibration damping and sound absorbing coating on a rigid substrate. 4,346,782, Cl. 181-207.000.

Bollinger, Frederic G.; D'Amico, John J.; and Hansen, Dale J., to Monsanto Company. Method for using nicotinic acid derivatives as plant growth regulants. 4,347,075, Cl. 71-94.000.

Bolton, Theodore S.: *See*—
Perrone, Terrence J.; Bolton, Theodore S.; and Caronna, Cosimo, 4,346,568, Cl. 62-259.100.

Bond, James W., to United States of America, Navy. Array convolver/correlator. 4,347,580, Cl. 364-824.000.

Bonnaterre, Raymond: *See*—
Bernard, Alain; and Bonnaterre, Raymond, 4,347,292, Cl. 429-65.000.

Bonnet, Marc; and Borde, Daniel, to Cycles Peugeot. A.C. Operated signalling device for mopeds. 4,347,497, Cl. 340-73.000.

Booth, Donald W., to Sperry Corporation. Live fire thermal target. 4,346,901, Cl. 273-408.000.

Bopp, Warren G., to Eaton Corporation. Magnetically actuated viscous fluid coupling. 4,346,797, Cl. 192-58.00B.

Borde, Daniel: *See*—
Bonnet, Marc; and Borde, Daniel, 4,347,497, Cl. 340-73.000.

Boren, Paul R.: *See*—
Jones, Donald E.; Parker, DeRay; and Boren, Paul R., 4,346,511, Cl. 29-458.000.

Borg-Warner Corporation: *See*—
Cheong, Alex S.; and Accursi, James F., 4,346,757, Cl. 165-51.000.

Borglum, Gerald B., to Miles Laboratories, Inc. Immobilization of microorganisms in gelled carrageenan. 4,347,320, Cl. 435-144.000.

Born, Maurice; Briquet, Lucienne; and de Gaudemaris, Gabriel, to Institut Francais du Petrole. Complexes of high iron content soluble in organic media and usable as combustion additives in liquid fuels. 4,347,062, Cl. 44-68.000.

Born, Raisa I. Method and apparatus for the preparation of drilling mud. 4,347,002, Cl. 366-6.000.

Borsig GmbH: *See*—
Kehrer, Wolfgang; and Lachmann, Helmut, 4,346,758, Cl. 165-134.00R.

Bosley, Denis V.: *See*—
Landsinger, Edmund E.; and Bosley, Denis V., 4,346,893, Cl. 273-85.00F.

Bosmiller, Erich, to Motoren-und Turbinen-Union Munchen GmbH. Arrangement for the thermal spraying of metal and ceramic powders. 4,346,818, Cl. 222-58.000.

Botez, Dan, to RCA Corporation. Single filament semiconductor laser with large emitting area. 4,347,486, Cl. 372-46.000.

Botha, Theunis C. Irrigation device and a method of operating such device. 4,346,842, Cl. 239-183.000.

Bouchard, Andre C.: *See*—
Fohl, Timothy; and Bouchard, Andre C., 4,347,053, Cl. 431-359.000.

Boudreaux, Gordon J.: *See*—
Bailey, August V.; Boudreaux, Gordon J.; and Sumrell, Gene, 4,347,378, Cl. 560-105.000.

Bourke, Patrick T. Slab-gripping apparatus. 4,346,691, Cl. 125-12.000.

Boutchyard, Hansford, Jr.: *See*—
Giguere, Edward L.; Kaiser, Paul H., Campbell, Gordon M.; Hoffman, Peter F.; and Boutchyard, Hansford, Jr., 4,347,568, Cl. 364-300.000.

Bouyssounouse, Bernard: *See*—
Liang, Victor K. C.; Bouyssounouse, Bernard; and Yim, Ernest W., 4,346,512, Cl. 29-571.000.

Bowers, James C.: *See*—
Brooks, James L.; Staab, Roger I.; Bowers, James C.; and Nienhaus, Harry A., 4,347,474, Cl. 323-224.000.

Bowers, William S., to Cornell Research Foundation, Inc. Anti-juvenile hormones. 4,347,256, Cl. 424-311.000.

Boxer, Trevor C., to Lucas Industries Limited. Control circuit for a D.C. motor. 4,347,467, Cl. 318-317.000.

Boyadjieff, George I., to Varco International, Inc. Well pipe spinning and torqueing apparatus. 4,346,631, Cl. 81-57.340.

Boychuk, Zenovie. Apparatus for and method of lubricating a distributor for an internal combustion engine. 4,346,680, Cl. 123-146.50A.

Braswell, Harry A.: *See*—
Skinner, Neal G.; and Braswell, Harry A., 4,346,761, Cl. 166-206.000.

Braun, Dietrich: *See*—
Wahlig, Helmut; Dingeldain, Elvira; and Braun, Dietrich, 4,347,234, Cl. 424-15.000.

Braun, Ernst, to Halbach & Braun. Hauling and cutting plant. 4,346,938, Cl. 299-43.000.

Bray, Kurtis R.: *See*—
Polito, Alan J.; and Bray, Kurtis R., 4,347,058, Cl. 23-230.00B.
Polito, Alan J.; and Bray, Kurtis R., 4,347,059, Cl. 23-230.00B.

Brewbaker, James L., to Dow Chemical Company, The. Thickened vinyl ester resin compositions. 4,347,343, Cl. 525-530.000.

Bricmont & Associates, Inc.: *See*—
Kletch, Stanley J., 4,346,753, Cl. 165-9.100.

Brigante, Miguel F. Electromagnetic ground water conditioning system and sampling device for waste water and fermentation makeup water. 4,347,133, Cl. 210-138.000.

Bright, Edward J.; Kaplon, David A.; and Scheingold, William S., to AMP Incorporated. Connector for a ceramic substrate. 4,346,952, Cl. 339-17.0CF.
Bright, Margaret N.: *See—*
Ong, S. Christine; and Bright, Margaret N., 4,347,344, Cl. 526-347.100.
Brindak, Nicholas J., to Drew Chemical Corporation. Process and apparatus for testing fluids for fouling and antifoulant protocol. 4,346,587, Cl. 73-61.200.
Brindle, Brian, to Illinois Tool Works Inc. Drill screw. 4,347,027, Cl. 411-387.000.
Briquet, Lucienne: *See—*
Born, Maurice; Briquet, Lucienne; and de Gaudemaris, Gabriel, 4,347,062, Cl. 44-68.000.
Bristol-Myers Company: *See—*
Cron, Martin J.; Keil, John G.; Lin, Jeng S.; Ruggeri, Mariano; and Walker, Derek, 4,347,354, Cl. 536-10.000.
British Nuclear Fuels Limited: *See—*
Gillies, George M., 4,346,673, Cl. 122-31.00R.
Britzke, Ingo; Horn, Manfred; and Gossmann, Peter, to Gebr. Bode & Co. GmbH. Drive for a vehicle door. 4,346,533, Cl. 49-28.000.
Bronner, Hermann: *See—*
Geisslinger, Wolfgang; Pustka, Karel; Bronner, Hermann; Mullritter, Ludwig; and Vondrowski, [illegible], 4,346,616, Cl. 192-84.00C.
Brook, Richard J.: *See—*
Hunter, Donald N.; and Brook, Richard J., 4,347,495, Cl. 338-34.000.
Brooks, James L.; Staab, Roger I.; Bowers, James C.; and Nienhaus, Harry A., to United States of America, Navy. Solid state regulated power transformer with waveform conditioning capaoility. 4,347,474, Cl. 323-224.000.
Brooks, Jeffrey B.: *See—*
Moore, Robert A.; Norlund, Bruce K.; Kontrovitz, Harold S.; Robbins, Clayton B.; and Brooks, Jeffrey B., 4,347,525, Cl. 346-153.100.
Brooks, Maxim C.: *See—*
Murphy, Alan P.; Smith, Rory M.; and Brooks, Maxim C., 4,347,168, Cl. 252-547.000.
Brown, Clifford G., to International Business Machines Corporation. Operator interchangeable gear driven platen and platen drive mechanism for typewriters and printers. 4,347,009, Cl. 400-611.000.
Brown, Rodney J.; and Swaisgood, Harold E., to Research Triangle Institute. Detection of antibiotics in milk. 4,347,312, Cl. 435-7.000.
Brown, Winthrop K., to Texaco Inc. Gain stabilization for radioactivity well logging apparatus. 4,346,590, Cl. 73-151.000.
Brownlee, Robert. Liquid chromatographic pump module. 4,347,131, Cl. 210-101.000.
Brownlee, Wanda J. Playing card caddy. 4,346,895, Cl. 273-150.000.
Brucato, Albert, to Chemithon Corporation, The. Strength of paper from mechanical or thermomechanical pulp. 4,347,100, Cl. 162-10.000.
Brucken, Byron L.; and Hodits, Frank W., Jr., to General Motors Corporation. Swash plate compressor. 4,347,046, Cl. 417-269.000.
Brunet France S.A.: *See—*
Brunet, Robert, 4,346,696, Cl. 126-450.000.
Brunet, Robert, to Brunet France S.A. Solar energy collector. 4,346,696, Cl. 126-450.000.
Brunswick Corporation: *See—*
Tyner, Alfred E., 4,346,676, Cl. 123-41.740.
Bruynes, Cornelis A., to Gist-Brocades N.V. Cephalosporin intermediates. 4,347,358, Cl. 544-016.000.
Bryden, Norman E. Tilting arbor belt sander. 4,346,536, Cl. 51-135.00R.
Buehrle, Thomas M.: *See—*
Landsness, Clifford A.; and Buehrle, Thomas M., 4,347,477, Cl. 324-54.000.
Bunger, Richard E. Prefabricated mold inserts for forming flume platforms for animal confinement pens and method of construction. 4,346,670, Cl. 119-28.000.
Bunnell Plastics, Inc.: *See—*
Anderson, Edward P.; and Curran, Donald G., 4,347,090, Cl. 156-149.000.
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Giobbio, Vincenzo; and Buracchi, Livio, 4,347,247, Cl. 424-250.000.
Burk, Johst H.: *See—*
Michel, Christian G.; Ertell, Carolyn A.; and Burk, Johst H., 4,347,325, Cl. 501-1.000.
Burke, James W. Automatic starting fluid injection apparatus. 4,346,683, Cl. 123-180.00R.
Burkman, Thomas F., Sr.; and Cummings, Gary, to Burkman, Thomas F., Sr. Emergency guidance system. 4,347,499, Cl. 340-371.000.
Burlington Industries, Inc.: *See—*
Willis, Robert F., 4,346,997, Cl. 356-244.000.
Burnham, Francis L. Multiple-stage small temperature differential heat-powered pump. 4,347,045, Cl. 417-253.000.
Burnham, Robert D.: *See—*
Scifres, Donald R.; Burnham, Robert D.; and Streifer, William, 4,347,611, Cl. 372-45.000.
Burroughs Corporation: *See—*
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Burroughs Wellcome Co.: *See—*
Findlay, John W. A.; Butz, Robert F.; and Welch, Richard M., 4,347,178, Cl. 260-112.00B.
Krenitsky, Thomas A.; and Rideout, Janet L., 4,347,315, Cl. 435-87.000.
Mehta, Nariman B., 4,347,176, Cl. 260-112.00B.
Phillips, Arthur P., 4,347,177, Cl. 260-112.00B.
Scharver, Jeffrey D., 4,347,382, Cl. 564-183.000.
Stern, Warren C., 4,347,257, Cl. 424-330.000.
Burton, Barrie C.: *See—*
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Busby, William R.: *See—*
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Busch, Lloyd E.: *See—*
Myers, George D.; and Busch, Lloyd E., 4,347,122, Cl. 208-113.000.
Busch, Louis M. Rotary cutter lathe tool. 4,346,746, Cl. 145-115.000.
Bustos, Rafael T., to Leggett & Platt, Incorporated. Shelf organizer. 4,346,806, Cl. 211-49.00S.
Butz, Robert F.: *See—*
Findlay, John W. A.; Butz, Robert F.; and Welch, Richard M., 4,347,178, Cl. 260-112.00B.
C.M.E. F. Lli Paietta: *See—*
Paietta, Fausto, 4,346,856, Cl. 242-74.000.
C. W. Zumbiel Company, The: *See—*
Hauser, Donald P., 4,346,830, Cl. 225-49.000.
CAE Machinery Ltd.: *See—*
Beer, Douglas C.; and Jatzek, Horst J., 4,346,744, Cl. 144-176.000.
Weavell, Jack; and Jatzek, Horst J., 4,346,745, Cl. 144-176.000.
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Caille, Gilles E. A., to Expandet. Plastic end cover for drums. 4,346,816, Cl. 220-306.000.
Calhoun, Howard J., to Westinghouse Electric Corp. Ratio ground relay. 4,347,542, Cl. 361-76.000.
Campbell, Gordon M.: *See—*
Giguere, Edward L.; Kaiser, Paul H.; Campbell, Gordon M.; Hoffman, Peter F.; and Boutchyard, Hansford, Jr., 4,347,568, Cl. 364-300.000.
Campbell, Ramsey G., to Stauffer Chemical Company. Process for preparing ethylene dichloride. 4,347,391, Cl. 570-252.000.
Cannon, Raymond E.; Jenkins, Jon A.; and Wilson, Larry L., to IMED Corporation. Rate meter. 4,346,606, Cl. 73-861.410.
Canon Kabushiki Kaisha: *See—*
Fukuda, Tadaji; Sugata, Masao; Nakagiri, Takashi; and Konishi, Masaki, 4,347,436, Cl. 250-211.00R.
Ishihara, Shunichi; Kitajima, Nobuo; Nishigaki, Yuji; and Kitahara, Nobuko, 4,347,296, Cl. 430-42.000.
Ishihara, Shunichi; Kitajima, Nobuo; Nishigaki, Yuji; and Kitahara, Nobuko, 4,347,297, Cl. 430-42.000.
Katsuma, Makoto; Suzuki, Masayuki; Shinbori, Kenichi; and Murakami, Hiroyasu, 4,346,973, Cl. 354-152.000.
Kawabata, Takashi; Tsunekawa, Tokuichi; Hosoe, Kazuya; Kinoshita, Takao; Sakai, Shinji; and Taguchi, Tatsuya, 4,346,970, Cl. 354-25.000.
Kimura, Hiroyuki; Tamura, Shuichi; and Yokota, Hideo, 4,346,988, Cl. 356-1.000.
Kuge, Tsukasa; Tamura, Yasuyuki; and Tanigawa, Koichi, 4,346,986, Cl. 355-14.0CH.
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Banos, Jean; Cantagrel, Jean-Claude; Cahuzac, Georges; and Darrieux, Jean-Louis, 4,346,741, Cl. 139-387.00R.
Caplan, Clark R.: *See—*
Scarton, Henry A.; Kennedy, Warren C.; Gaylo, Keith R.; and Caplan, Clark R., 4,346,783, Cl. 181-230.000.
Captocap Limited: *See—*
Hilaire, Fernand, 4,346,811, Cl. 215-252.000.
Caras, Bernard; and Kollmyer, Robert E., to Burroughs Corporation. Method for providing a gas reservoir for a gas display panel. 4,346,951, Cl. 316-19.000.
Carl Freudenberg, Firma: *See—*
Weber, Kurt; Rutsch, Peter; and Hirschinger, Lothar, 4,347,276, Cl. 428-160.000.
Carl Zeiss-Stiftung: *See—*
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Carlingswitch, Inc.: *See—*
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Mune, Charles; and Krasij, Bohdan, 4,347,488, Cl. 335-9.000.
Sorenson, Richard W., 4,347,417, Cl. 200-67.00G.
Carlo Erba Strumentazione S.p.A.: *See—*
Sisti, Giorgio; Tosi, Bruno; and Trestianu, Sorin, 4,347,215, Cl. 422-63.000.
Carlson, Gene D.: *See—*
Ehrhardt, Gerry H.; and Carlson, Gene D., 4,347,282, Cl. 428-320.400.
Carlson, John A.: *See—*
Jalichandra, Phijit; Dowell, John S.; and Carlson, John A., 4,346,987, Cl. 355-40.000.
Carlson, Randolph S., to Elving, Robert L. Incident illumination responsive light control. 4,347,461, Cl. 315-158.000.
Carnaghan, Luason L.; and Phillips, Raymond J., to United States of America, Navy. Antenna coupling assembly. 4,346,953, Cl. 339-28.000.

Carocci, Alfred: *See*—
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Caronna, Cosimo: *See*—
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Carr, Frederick: *See*—
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Carrier Corporation: *See*—
Holdsworth, Timothy M., 4,347,042, Cl. 417-53.000.
Morris, Richard D., 4,347,043, Cl. 417-53.000.
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Carter, Russell W., to Corn States Metal Fabricators, Inc. Method for forming a tire. 4,347,212, Cl. 264-315.000.
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Baumann, David L.; and Meismer, Richard A., 4,346,508, Cl. 29-402.180.
Vidal-Meza, Gonzalo D., 4,346,760, Cl. 165-166.000.
Cavazza, Claudio, to Sigma-Tau Industrie Farmaceutiche Riunite. Apparatus for mixing and dispersing two substances under sterile conditions. 4,346,820, Cl. 222-83.000.
CBS Inc.: *See*—
Davis, Lanny C., 4,347,405, Cl. 179-1.00G.
Chabrerie, Jean-Pierre, to Etat Francais. Sliding electrical contact devices. 4,347,456, Cl. 310-248.000.
Challen, Ian A.; East, Sandra; and Sanderson, George R., to International Octrooi Maatischappit "Octropa" B.V. Process for preparation of algin or pectin gels. 4,347,261, Cl. 426-573.000.
Chalmers, Gerald W.: *See*—
Hibbs, Joseph E.; Chalmers, Gerald W.; and Teixeira, Walter J., 4,346,658, Cl. 102-254.000.
Charmasson, Henri J. A.: *See*—
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Chase, Charles: Walters, Stephen; and Meador, Richard E., to P.M. America, Inc. Method for diluting a liquid test sample and computer controlld diluting apparatus. 4,346,742, Cl. 141-1.000.
Chass, Jacob, to Pickering & Company, Inc. Rotary variable differential transformer with substantially linear output. 4,347,491, Cl. 336-135.000.
Chatlos, Richard, to Air O Scoop Corporation. Attachment for motor vehicles with rear windows. 4,346,648, Cl. 98-2.120.
Cheddar Valley Engineering Limited: *See*—
Thorpe, Joseph F., 4,346,906, Cl. 280-33.99H.
Chemithon Corporation, The: *See*—
Brucato, Albert, 4,347,100, Cl. 162-10.000.
Chen, Wen T.; and Oxley, Vincent C., to GTE Laboratories Incorporated. Circuit breaker. 4,347,541, Cl. 361-50.000.
Cheong, Alex S.; and Accursi, James F., to Borg-Warner Corporation. Automotive cooling system using a non-pressurized reservoir bottle. 4,346,757, Cl. 165-51.000.
Chernikhov, Alexei Y.; Yakovlev, Mikhail N.; Lysova, Valentina B.; Gefter, Evgeny L.; and Shmagina, Nina N. Heat-resistant heterocyclic polymers and methods for producing same. 4,347,348, Cl. 528-51.000.
Chesnais, Andre; and Thiery, Philippe, to Souriau & Cie; and Socapex. Self-stripping terminal for an electrical connector. 4,346,955, Cl. 339-97.00R.
Chester, Arthur W.: *See*—
Chu, Yung F.; and Chester, Arthur W., 4,347,395, Cl. 585-420.000.
Chevallier, Arnauld, to Societe Grenobloise d'Etudes et d'Applications Hydrauliques (SOGREAH). Barrier block for protecting coastal and riverside structures. 4,347,017, Cl. 405-29.000.
Chevron Research Company: *See*—
Detz, Clifford M.; and Field, Leslie A., 4,347,394, Cl. 585-419.000.
Mayer, Jerome F.; Miller, Stephen J.; and O'Rear, Dennis J., 4,347,121, Cl. 208-58.000.
Sigworth, Harry W., Jr., 4,346,731, Cl. 137-433.000.
Child, Francis W., to Child Laboratories Inc. Method of inserting teat dilator. 4,346,714, Cl. 128-343.000.
Child Laboratories Inc.: *See*—
Child, Francis W., 4,346,714, Cl. 128-343.000.
Childs, Billie W., executrix: *See*—
Childs, William C., deceased; Snook, Richard K.; and Lester, Douglas R., 4,346,604, Cl. 73-861.120.
Childs, William C., deceased (by Childs, Billie W., executrix); Snook, Richard K.; and Lester, Douglas R., to Narco Bio-Systems, Inc. Electromagnetic flow probe. 4,346,604, Cl. 73-861.120.
Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T.: *See*—
Bitter, Istvan; Soos, Rudolf; Toth, Geza; Toke, Laszlo; and Szabo, Gabor, 4,347,377, Cl. 560-32.000.
Cho, Hideyuki. Tenter arm swinging apparatus. 4,346,502, Cl. 26-76.000.
Cho, Kazunobu; Beauchamp, Roger P.; and Batemou, Robert F., to Dart Industries Inc. Closured and divided box. 4,346,813, Cl. 220-22.000.
Chraplyvy, Andrew R.; Herbst, Jan F.; and Croat, John J., to General Motors Corporation. Selective magnetization of rare-earth transition metal alloys. 4,347,086, Cl. 148-101.000.
Christensen, Burton G.; Johnston, David B. R.; and Schmitt, Susan M., to Merck & Co., Inc. 3-Substituted-6-(1'-hydroxyethyl)-7-oxo-1-azabicyclo[3.2.0]-hept-2-ene-2-carboxylic acid. 4,347,367, Cl. 546-272.000.
Christensen, Burton G.; Johnston, David B. R.; and Schmitt, Susan M., to Merck & Co., Inc. 3-Substituted-6-substituted-7-oxo-1-azabicyclo[3.2.0]hept-2-ene-2-carboxylic acid. 4,347,368, Cl. 546-272.000.
Christian Rovsing A/S: *See*—
Seiersen, Ole S., 4,347,560, Cl. 363-24.000.
Christian, Ted W.: *See*—
Latimer, John P.; Donaldson, Robert M.; Christian, Ted W.; and Miller, Glenn E., 4,346,937, Cl. 299-8.000.
Chu, Daniel T., to Abbott Laboratories. Inhibitors of transpeptidase. 4,347,355, Cl. 542-420.000.
Chu, Yung F.; and Chester, Arthur W., to Mobil Oil Corporation. Conversion of paraffinic hydrocarbons to aromatics over zeolite catalysts. 4,347,395, Cl. 585-420.000.
Chupak, John M.: *See*—
Daugherty, James D.; Gladd, Joseph H.; and Chupak, John M., 4,346,959, Cl. 339-217.00S.
Chute, Richard; Larson, Jay M.; Tunnecliffe, Theodore N.; and Worthen, Roger P., to Eaton Corporation. Thermal barrier for poppet valve. 4,346,870, Cl. 251-356.000.
Cianflone, Robert A. Mustache trimmer. 4,346,517, Cl. 30-49.000.
Ciba-Geigy Corporation: *See*—
Lukaszczyk, Alfons; Martin, Henry; Diel, Peter J.; Fory, Werner; Gatzi, Karl; Kristinsson, Haukur; Mulier, Beat; Muntwyler, Rene; Pachlatko, Johannes P.; Rempfler, Hermann; Schurter, Rolf; and Szczepanski, Henry, 4,347,372, Cl. 548-217.000.
Neher, Robert; and Riniker, Bernhard, 4,347,242, Cl. 424-177.000.
Winter, Roland A. E.; and Dexter, Martin, 4,347,180, Cl. 260-206.000.
Citizen Watch Company Limited: *See*—
Nakahara, Tsunamitsu; Aoki, Hiroshi; and Kurisu, Toru, 4,346,947, Cl. 308-9.000.
Clancy, Bruce N. Checkbook accounting system. 4,346,917, Cl. 283-58.000.
Clifft, Dale L. Power assisting device for a manually operating vehicle. 4,346,772, Cl. 180-11.000.
Close, Donald, to David Hudson, Inc. Novel fluoroelastomer film compositions containing vinyl copolymers and method for the preparation thereof. 4,347,268, Cl. 427-385.500.
Closs, Felix H.: *See*—
Lee, Robert P.; and Closs, Felix H., 4,347,498, Cl. 340-825.020.
Cloud, James Z., Jr.: *See*—
Little, John D.; and Cloud, James Z., Jr., 4,346,699, Cl. 128-82.000.
Cohen, Kenneth W.; and Mansey, George P., to Aerco International, Inc. Heat reclaiming system. 4,346,759, Cl. 165-163.000.
Cohen, Kopel H. Method for treating depression and other maladies by means of patient-created symptom graphs. 4,346,697, Cl. 128-1.00R.
Colliren, Chester P., to Eaton Corporation. Tension indicating and lock cone washer. 4,347,024, Cl. 411-11.000.
Cole, Martin; and Edmondson, Robert A., to Beecham Group Limited. Process for the preparation of penicillin derivatives. 4,347,314, Cl. 435-43.000.
Colegrove, George T., to Merck & Co., Inc. Use of S-119 in lithographic fountain solutions. 4,347,289, Cl. 428-457.000.
Colgate-Palmolive Company: *See*—
Larsen, John E.; and McGregor, Rob Roy, 4,346,525, Cl. 36-69.000.
Wixon, Harold E., 4,347,152, Cl. 252-174.000.
College, Michael A.; and McKenry, Robert J., to Kennametal Inc. Excavating bit. 4,346,934, Cl. 299-92.000.
Colligan, Wallace M. Portable power tool. 4,347,450, Cl. 310-50.000.
Combustion Engineering, Inc.: *See*—
Nelson, Hugh W., 4,347,102, Cl. 162-35.000.
Nelson, Hugh W.; Prohazka, George J.; and Morris, Keith W., 4,347,220, Cl. 422-185.000.
Commissariat a l'Energie Atomique: *See*—
Nicolau, Ion F., 4,347,230, Cl. 423-491.000.
Compagnie Generale de Geophysique: *See*—
Manin, Michel G., 4,346,779, Cl. 181-120.000.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
Jacob, Jean-Baptiste; Mathieu, Yves; and Ruvoen, Michel, 4,347,603, Cl. 370-85.000.
Condolios, Elie; and Couratin, Pierre, to Alsthom-Atlantique. Installation for and a method of spreading clayey mud and reclaiming land. 4,347,140, Cl. 210-710.000.
Conoco Inc.: *See*—
Anderson, Ardis L.; and McConaghy, James R., 4,347,120, Cl. 208-50.000.
Conrad, Rainer; and Seifert, Hubert, to Rowenta-Werke GmbH. Handle and supporting structure for an electric pressing iron having electronic temperature control. 4,347,428, Cl. 219-251.000.
Conroy, Ernest F., Jr.: *See*—
Gary, Wardell; and Conroy, Ernest F., Jr., 4,347,540, Cl. 361-47.000.
Conservation Associates Incorporated: *See*—
Harmony, Richard C., 4,346,844, Cl. 239-383.000.
Conshohocken Cotton Co., Inc.: *See*—
Schwartz, Ira, 4,346,553, Cl. 57-210.000.
Continental Group, Inc., The: *See*—
Banich, John N., Sr., 4,346,812, Cl. 215-352.000.
Miller, Teddy, 4,346,743, Cl. 141-3.000.
Stamets, Stanley L.; Winkless, Robert A.; Hernandez, Rafael J.; Merle, Joseph J.; and Payne, Robert D., 4,346,667, Cl. 118-622.000.

Convers, Charles C.: *See—*
Mayo, Alfred M.; and Convers, Charles C., 4,347,093, Cl. 156-242.000.

Cooper Industries, Inc.: *See—*
Workman, William, Jr., 4,346,765, Cl. 173-12.000.

Cooper, John; and Lee, Dennis V., to Smith Kline & French Laboratories Limited. Process for the preparation of 5-dimethylaminomethyl-2-furanmethanol. 4,347,191, Cl. 549-492.000.

Cooper, Julius; and Tilbor, Neil, to Ideal Toy Corporation. Driver skill test for toy miniature vehicles. 4,346,894, Cl. 273-86.00B.

Cooper, Paul, to TRW Inc. Fuel supply apparatus. 4,347,041, Cl. 417-15.000.

Cooper, Walter R. Admission device for an inlet manifold of an internal combustion engine. 4,347,068, Cl. 55-319.000.

Copal Company Limited: *See—*
Saito, Toshihisa; and Inoue, Nobuyoshi, 4,346,974, Cl. 354-154.000.
Takahashi, Tamotsu, 4,346,972, Cl. 354-195.000.

Corn States Metal Fabricators, Inc.: *See—*
Carter, Russell W., 4,347,212, Cl. 264-315.000.

Cornell Research Foundation, Inc.: *See—*
Bowers, William S., 4,347,256, Cl. 424-311.000.

Corning Glass Works: *See—*
Herczog, Andrew, 4,347,295, Cl. 429-193.000.
Wu, Che-Kuang, 4,347,309, Cl. 430-616.000.

Corrigan, Charles E., to Garrett Corporation, The. Laminated airfoil and method for turbomachinery. 4,347,037, Cl. 416-97.00A.

Cosyns, Jean; Durand, Daniel; and Leger, Gerard, to Institut Francais du Petrole. Process for the selective hydrogenation of a hydrocarbon fraction with 2 or 3 carbon atoms per molecule. 4,347,392, Cl. 585-259.000.

Coughlin, Steve A.: *See—*
Ware, Don A.; Coughlin, Steve A.; and Whatley, Oscie B., 4,347,426, Cl. 219-125.100.

Couratin, Pierre: *See—*
Condolios, Elie; and Couratin, Pierre, 4,347,140, Cl. 210-710.000.

Couturier, Rene J.: *See—*
Zeller, Bernard M.; Couturier, Rene J.; and Tribot, Robert A., 4,347,087, Cl. 149-98.000.

Cox, Alan W.; and Rainey, Paul N., to Black & Decker Inc. Variable resistance exercising device. 4,346,886, Cl. 272-72.000.

Cox, Gordon F. N.: *See—*
Johnson, Jerome B.; and Cox, Gordon F. N., 4,346,600, Cl. 73-768.000.

Cox, Randolph B., to Research Products Corporation. Water distributor. 4,347,197, Cl. 261-106.000.

Crawley, Terrance V. Railroad rail fragmenting apparatus and method. 4,346,828, Cl. 225-2.000.

Crescenzo, Francis C.; and LaFleur, Paul J., Jr., to Package Machinery Company. Sealing wheel for forming fin seal package. 4,346,545, Cl. 53-234.000.

Croat, John J.: *See—*
Chraplyvy, Andrew R.; Herbst, Jan F.; and Croat, John J., 4,347,086, Cl. 148-101.000.

Crompton, Alan W., to Alf Hannaford & Co. Pty. Limited. Method of separating almond kernels from almonds with shells. 4,347,260, Cl. 426-483.000.

Cron, Martin J.; Keil. John G.; Lin, Jeng S.; Ruggeri, Mariano; and Walker, Derek, to Bristol-Myers Company. Preparation of 1-N-[ω-amino-α-hydroxyalkanoyl]aminoglycoside polysilylated antibiotics and products obtained therefrom. 4,347,354, Cl. 536-10.000.

Crone, John M., Jr.; and Suggitt, Robert M., to Texaco Inc. Process for preparation of 1-methyl-3,5-diisopropyl benzene. 4,347,398, Cl. 585-474.000.

Cross, Michael: *See—*
Latimer, John P.; Donaldson, Robert; Cross, Michael; MacPhaiden, Harold; Skiles, Loren D.; Schauer, Henry; and Reynolds, Thomas J., 4,347,029, Cl. 414-22.000.

Cruz, Jose C., to Cummins Engine Company, Inc. Secondary alignment target for an electro-optical alignment measuring system. 4,346,994, Cl. 356-152.000.

CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Appiano, Silvano; Di Pino, Duccio; and Poggio, Cesare, 4,347,608, Cl. 371-16.000.

Cullen, Donald E., to United Technologies Corporation. Dual range, cantilevered mass accelerometer. 4,346,597, Cl. 73-510.000.

Cullet, Rene, to International Business Machines Corporation. Test methods and structures for semiconductor integrated circuits for electrically determining certain tolerances during the photolithographic steps. 4,347,479, Cl. 324-64.000.

Cumming, James C., to Rockwell International Corporation. Friction brake. 4,346,791, Cl. 188-71.500.

Cummings, Gary: *See—*
Burkman, Thomas F., Sr.; and Cummings, Gary, 4,347,499, Cl. 340-371.000.

Cummins Engine Company, Inc.: *See—*
Cruz, Jose C., 4,346,994, Cl. 356-152.000.

Cunningham, Sinclair: *See—*
Wusthof, Peter; and Cunningham, Sinclair, 4,346,645, Cl. 91-501.000.

Curran, Donald G.: *See—*
Anderson, Edward P.; and Curran, Donald G., 4,347,090, Cl. 156-149.000.

Currie, Russell D.: *See—*
Wrightson, Noel T.; and Currie, Russell D., 4,347,018, Cl. 405-150.000.

CVI Incorporated: *See—*
Hood, Charles B., 4,346,563, Cl. 62-117.000.

Cycles Peugeot: *See—*
Bonnet, Marc; and Borde, Daniel, 4,347,497, Cl. 340-73.000.

Czubak, Albin S., to Ex-Cell-O Corporation. Apparatus for honing cycloidal surfaces. 4,346,534, Cl. 51-34.00A.

Dahl, Helge: *See—*
Garlung, Walther; and Dahl, Helge, 4,346,808, Cl. 212-212.000.

Daido Tokushuko K.K.: *See—*
Yanagida, Minoru; and Kono, Tomio, 4,347,080, Cl. 75-124.000.

Dailey, Patrick E., to Smith International, Inc. Threaded connection using variable lead threads. 4,346,920, Cl. 285-89.000.

Daimler-Benz Aktiengesellschaft: *See—*
Binder, Hellmuth, 4,346,659, Cl. 104-247.000.
Gans, Wolfgang, 4,347,065, Cl. 55-6.000.

Dainichiseika Color & Chemicals Mfg. Co., Ltd.: *See—*
Torii, Hideyasu; and Nakamura, Susumu, 4,347,338, Cl. 525-123.000.

Dakin, Wayne R.; and Isailovic, Jordan, to Discovision Associates. Digital formatting system. 4,347,619, Cl. 375-37.000.

Dale, Robert V., to Fieldcrest Mills, Inc. Pile carpet tile with cut and loop pile. 4,347,273, Cl. 428-44.000.

Dalzell, Haldean C.: *See—*
Quick, James E.; Razdan, Raj K.; and Dalzell, Haldean C., 4,347,361, Cl. 546-45.000.

Dalziel, Warren L., to Shugart Associates. Read/write head carriage assembly. 4,347,535, Cl. 360-99.000.

D'Amico, John J.; and Schafer, David E., to Monsanto Company. 2-(Pyridylthio)pyridine-N-oxides. 4,347,366, Cl. 546-261.000.

D'Amico, John J.: *See—*
Bollinger, Frederic G.; D'Amico, John J.; and Hansen, Dale J., 4,347,075, Cl. 71-94.000.

Dany, Franz-Josef: *See—*
Staendeke, Horst; Dany, Franz-Josef; and Kandler, Joachim, 4,347,334, Cl. 524-416.000.

Darrieux, Jean-Louis: *See—*
Banos, Jean; Cantagrel, Jean-Claude; Cahuzac, Georges; and Darrieux, Jean-Louis, 4,346,741, Cl. 139-387.00R.

Dart Industries Inc.: *See—*
Cho, Kazunobu; Beauchamp, Roger P.; and Batemou, Robert F., 4,346,813, Cl. 220-22.000.
Kaus, Malcolm J.; and Miro, Nemesio D., 4,347,158, Cl. 252-429.00B.

Datascope Corp.: *See—*
Hanson, Bruce L.; and Wolvek, Sidney, 4,346,698, Cl. 128-1.00D.

Daugherty, James D.; Gladd, Joseph H.; and Chupak, John M., to General Motors Corporation. Pull-to-seat electrical connector. 4,346,959, Cl. 339-217.00S.

Daunora, Louis G., to Miles Laboratories, Inc. Water-soluble tablet. 4,347,235, Cl. 424-44.000.

David Hudson, Inc.: *See—*
Close, Donald, 4,347,268, Cl. 427-385.500.

Davis, James W.: *See—*
Paranjpe, Suresh C.; Davis, James W.; Scranton, Robert J.; and Wells, Roger D., 4,347,520, Cl. 346-75.000.

Davis, John M.; and Burton, Barrie C., to System E Controls Ltd. Variable inductance transducers. 4,347,492, Cl. 336-136.000.

Davis, John N.: *See—*
Gurr, George P.; Davis, John N.; and Wiggins, E. Thomas, 4,347,575, Cl. 364-492.000.

Davis, Kirk E., to Lubrizol Corporation, The. Full and lubricant compositions containing nitro phenols. 4,347,148, Cl. 252-51.50R.

Davis, Lanny C., to CBS Inc. Sound reproducing systems utilizing acoustic processing unit. 4,347,405, Cl. 179-1.00G.

Davis, Stephen H., to Water Refining Company, Inc. Reverse osmosis expansible pressurized permeate storage having permeate and concentrate controls. 4,347,132, Cl. 210-104.000.

Dearborn Fabricating & Engineering Corp.: *See—*
Dunville, Dennis L.; Seaton, William W.; and Good, Charles H., 4,346,799, Cl. 198-367.000.

De Ceuster, Jean; and Essemaeker, Paul, to Solvay & Cie. Process for the reclamation of waste paper. 4,347,099, Cl. 162-5.000.

Deepsea Ventures, Inc.: *See—*
Latimer, John P.; Donaldson, Robert M.; Christian, Ted W.; and Miller, Glenn E., 4,346,937, Cl. 299-8.000.
Latimer, John P.; Donaldson, Robert; Cross, Michael; MacPhaiden, Harold; Skiles, Loren D.; Schauer, Henry; and Reynolds, Thomas J., 4,347,029, Cl. 414-22.000.

Deere & Company: *See—*
Friesen, Henry; and Kizlyk, Mervin P., 4,347,031, Cl. 414-686.000.

de Gaudemaris, Gabriel: *See—*
Born, Maurice; Briquet, Lucienne; and de Gaudemaris, Gabriel, 4,347,062, Cl. 44-68.000.

Degesch GmbH: *See—*
Kapp, Wolfgang, 4,347,241, Cl. 424-128.000.

Degussa Aktiengesellschaft: *See—*
Schmid, Josef; Lange, Ludwig; Klebe, Hans; and Schutte, Dieter, 4,347,229, Cl. 423-336.000.

De Haven, Vernet F.; and Airhart, Forrest, to Ares, Inc. Foldout cradle apparatus for mounting an automatic cannon to a turret exterior. 4,346,644, Cl. 89-37.00B.

Del-Met Corporation: *See—*
Tatar, Richard, 4,346,940, Cl. 301-37.0AT.

Demou, John G.; Pray, Edward R.; and McBrayer, Robert L., to BASF Wyandotte Corporation. Low-cost surfactant compositions for high resiliency flexible foams. 4,347,330, Cl. 521-110.000.

Demuth, Robert, to Rieter Machine Works Ltd. Spinning preparatory machine. 4,346,500, Cl. 19-105.000.

Dennehey, T. Michael; Greff, Richard J.; and Wolf, Ludwig, Jr., to Baxter Travenol Laboratories, Inc. Solution container for continuous ambulatory peritoneal dialysis. 4,346,703, Cl. 128-213.00A.

Dentaurum H.P. Winkelstroeter KG: *See—*
Kraus, Hans-Joachim; and Walter, Berthold, 4,347,054, Cl. 433-7.000.

DeRoeck, Carrie P.: *See—*
Spencer, Patricia J.; and DeRoeck, Carrie P., 4,346,875, Cl. 269-302.100.

Derouane, Eric G.: *See—*
Sherwood, Rexford D.; Baker, Rees T. K.; Derouane, Eric G.; and Pieters, Wim J., 4,347,063, Cl. 48-197.00R.

Derrick, Arthur P.: *See—*
Boevink, Jan E.; Derrick, Arthur P.; and Moodie, John A., 4,347,339, Cl. 525-180.000.

de Ruyter, Peter W. A. Apparatus for making a meat analog. 4,346,652, Cl. 99-483.000.

DeSantis, Raymond P., to PTX-Dentronix, Inc. Die and punch assembly for compacting powder material. 4,347,051, Cl. 425-78.000.

DeTar, George F., Jr.; Schaefer, Marcus J.; and Busby, William R., to Rockwell International Corporation. Computer system apparatus for improving access to memory by deferring write operations. 4,347,567, Cl. 364-200.000.

Detz, Clifford M.; and Field, Leslie A., to Chevron Research Company. Benzene synthesis. 4,347,394, Cl. 585-419.000.

DeVries, Marvin R.: *See—*
Fertl, Walter H.; and DeVries, Marvin R., 4,346,592, Cl. 73-152.000.

Dexter, Martin: *See—*
Winter, Roland A. E.; and Dexter, Martin, 4,347,180, Cl. 260-206.000.

Diamant, Emanuel; Diamant, Lev; and Grushko, Benjamin, to Mahanaim Diuk Hydraulica. Milk flow measurement apparatus. 4,346,596, Cl. 73-200.000.

Diamant, Lev: *See—*
Diamant, Emanuel; Diamant, Lev; and Grushko, Benjamin, 4,346,596, Cl. 73-200.000.

Diamond Shamrock Corporation: *See—*
Giguere, Edward L.; Kaiser, Paul H.; Campbell, Gordon M.; Hoffman, Peter F.; and Boutchyard, Hansford, Jr., 4,347,568, Cl. 364-300.000.

Diaralux: *See—*
Faubert, Guy, 4,346,979, Cl. 354-307.000.

Dick, Donald E.; Metz, Robert L.; RoJohn, D. Scott; and Elliott, Raymond D. Transport mechanism for ultrasonic scanner. 4,346,867, Cl. 248-424.000.

Dick, Perry J., Jr., to Norwood Minerals, Inc. Apparatus for consolidation of slurries of solid particulate materials. 4,347,137, Cl. 210-329.000.

Diel, Peter J.: *See—*
Lukaszczyk, Alfons; Martin, Henry; Diel, Peter J.; Fory, Werner; Gatzi, Karl; Kristinsson, Haukur; Muller, Beat; Muntwyler, Rene; Pachlatko, Johannes P.; Rempfler, Hermann; Schurter, Rolf; and Szczepanski, Henry, 4,347,372, Cl. 548-217.000.

Diesel, Hans A., to Exxon Research & Engineering Co. Fluid sampling device. 4,346,609, Cl. 73-863.330.

Diesel Kiki Co., Ltd.: *See—*
Kaibara, Nobuhiro; and Takaichi, Kazuyoshi, 4,346,688, Cl. 123-502.000.

Dietz, Richard E.; and McDaniel, Max P., to Phillips Petroleum Company. Polymerization of olefins. 4,347,161, Cl. 252-429.00B.

Di Giacomo, Peter M., to Occidental Research Corporation. Sorting of ores with detectable compounds. 4,347,125, Cl. 209-3.300.

Dil, Jan G.; Driessen, Johannes C.; and Mesman, Wichert, to U.S. Philips Corporation. Dual probe interferometer for object profile measuring. 4,347,441, Cl. 250-560.000.

Dingeldain, Elvira: *See—*
Wahlig, Helmut; Dingeldain, Elvira; and Braun, Dietrich, 4,347,234, Cl. 424-15.000.

Dinger, Edward H., to General Electric Company. Electronic-magnetic current isolator circuit. 4,347,469, Cl. 318-533.000.

Di Pino, Duccio: *See—*
Appiano, Silvano; Di Pino, Duccio; and Poggio, Cesare, 4,347,608, Cl. 371-16.000.

Discenza, Frank J.; and Ives, Milton N., to Carlingswitch, Inc. Progressive switch. 4,347,411, Cl. 200-1.00B.

Discovision Associates: *See—*
Dakin, Wayne R.; and Isailovic, Jordan, 4,347,619, Cl. 375-37.000.
Vitale, George, 4,347,599, Cl. 369-270.000.

Doane, H. Daniel: *See—*
Smith, Verity C.; Baker, Robert J.; Barrow, Wyile W., Jr.; and Doane, H. Daniel, 4,346,923, Cl. 285-340.000.

Dobier, Peter: *See—*
Schoettle, Klaus; Dobler, Peter; Gliniorz, Lothar; and Hoffmann, Werner, 4,347,537, Cl. 360-132.000.

Dr. C. Otto & Comp. G.m.b.H: *See—*
Wackerbarth, Folkard, 4,347,106, Cl. 202-141.000.

Dr. C. Otto & Comp. G.m.b.H.: *See—*
Kwasnik, Hans-Jurgen; and Piduch, Hans-Gunter, 4,347,105, Cl. 202-263.000.

Dodd, Malcolm J.; and Juhas, Joseph A., to UOP Inc. Apparatus for selectively heating an individual food item in a refrigerated environment. 4,346,756, Cl. 165-48.00R.

Doldouras, George A.: *See—*
Kollonitsch, Janos; Perkins, Leroy M.; Doldouras, George A.; and Marburg, Stephen, 4,347,374, Cl. 548-344.000.

Domres, Franklin W. Lead screw portable torch drive. 4,346,873, Cl. 266-71.000.

Donaldson, Robert: *See—*
Latimer, John P.; Donaldson, Robert; Cross, Michael; MacPhaiden, Harold; Skiles, Loren D.; Schauer, Henry; and Reynolds, Thomas J., 4,347,029, Cl. 414-22.000.

Donaldson, Robert M.: *See—*
Latimer, John P.; Donaldson, Robert M.; Christian, Ted W.; and Miller, Glenn E., 4,346,937, Cl. 299-8.000.

Dorlars, Alfons, to Bayer Aktiengesellschaft. Process for the preparation of v-triazole compounds. 4,347,357, Cl. 542-462.000.

Dow Chemical Company, The: *See—*
Brewbaker, James L., 4,347,343, Cl. 525-530.000.
Ginter, Sally P.; Pawloski, Chester E.; and Stevens, Violete L., 4,347,194, Cl. 260-929.000.
Harmon, Zita T. K.; and Lindy, Lowell B., 4,347,328, Cl. 521-28.000.
Lee, John M.; and Bauman, William C., 4,347,327, Cl. 521-28.000.
Park, Chung P., 4,347,329, Cl. 521-79.000.
Simmons, Robert W., 4,347,154, Cl. 252-305.000.
Swart, Daniel J., 4,347,351, Cl. 528-271.000.

Dow Corning Corporation: *See—*
Homan, Gary R.; and Romig, Charles A., 4,347,336, Cl. 524-731.000.
Speier, John L.; and Gentle, Thomas M., 4,347,199, Cl. 264-8.000.

Dow, William G., to Environmental Institute of Michigan. Trochoidal nuclear fusion reactor. 4,347,621, Cl. 376-139.000.

Dowell, Howard A.: *See—*
Norman, Edward C.; and Dowell, Howard A., 4,347,266, Cl. 427-154.000.

Dowell, John S.: *See—*
Jalichandra, Phijit; Dowell, John S.; and Carlson, John A., 4,346,987, Cl. 355-40.000.

Doyen, Joel; and Raisin, Jean-Pierre, to Agence Nationale de Valorisation de la Recherche. Device for handling sheet-like pieces. 4,346,877, Cl. 271-19.000.

Doyle, Gerald, to Exxon Research & Engineering Co. Removal of CO and unsaturated hydrocarbons from gas streams using copper oxalate complexes. 4,347,066, Cl. 55-56.000.

Dresser Industries, Inc.: *See—*
Fertl, Walter H.; and DeVries, Marvin R., 4,346,592, Cl. 73-152.000.
Howells, Anthony P. S.; Viswanathan, Raman; and Angehrn, Jorg A., 4,346,593, Cl. 73-152.000.

Dressler, Daryl D., to Minnesota Mining and Manufacturing Company. Moisture-insensitive electrically-conductive paper. 4,347,104, Cl. 162-103.000.

Drew Chemical Corporation: *See—*
Brindak, Nicholas J., 4,346,587, Cl. 73-61.200.

Driessen, Johannes C.: *See—*
Dil, Jan G.; Driessen, Johannes C.; and Mesman, Wichert, 4,347,441, Cl. 250-560.000.

Dubeau, Michel L.: *See—*
Legrand, Paul J.; Dubeau, Michel L.; and Pachomoff, Guy R., 4,346,861, Cl. 244-54.000.

Dugan, Charles D., to Automatic Pipe Racker, Inc. Pipe handling apparatus. 4,347,028, Cl. 414-22.000.

Dugle, Thomas: *See—*
Orlowski, Gerald J.; and Dugle, Thomas, 4,346,654, Cl. 100-268.000.

Dunshee, Wayne K.; and Odegaard, Janice B., to Minnesota Mining & Manufacturing Company. Pressure-sensitive adhesive sheet material. 4,346,700, Cl. 128-155.000.

Dunville, Dennis L.; Seaton, William W.; and Good, Charles H., to Dearborn Fabricating & Engineering Corp. Conveyor system with part transfer device. 4,346,799, Cl. 198-367.000.

Du Pont de Nemours, E. I., and Company: *See—*
Marcus, Sanford M., 4,347,262, Cl. 427-74.000.
Shook, Howard E., Jr., 4,347,193, Cl. 260-439.00R.
Siemionko, Roger K., 4,347,349, Cl. 528-190.000.

Durand, Daniel: *See—*
Cosyns, Jean; Durand, Daniel; and Leger, Gerard, 4,347,392, Cl. 585-259.000.

Durant, Graham J.; Ganellin, Charon R.; Owen, Geoffrey R.; and Young, Rodney C., to Smith Kline & French Laboratories Limited. Pyridyl alkylthiourea and alkylamino-nitroethylene. 4,347,250, Cl. 424-263.000.

Dusza, John P.: *See—*
Joseph, Joseph P.; Dusza, John P.; and Bernstein, Seymour, 4,347,251, Cl. 424-263.000.

Duttera, James; Jefferis, Raymond P., III; Matteson, David; and Szentlaszloi, Alexander, to Gulf & Western Manufacturing Company. Apparatus and method for froth flotation separation of the components of a slurry. 4,347,127, Cl. 209-164.000.

Duwel, Edward C.; and Soderberg, John H., to Pitney Bowes, Inc. Electronic postage meter having check date warning with control for overriding the check date warning. 4,347,506, Cl. 340-679.000.

Dwyer, Francis G.; and Huss, Albin, Jr., to Mobil Oil Corporation. Treatment of effluent resulting from conversion of methanol to gasoline in order to decrease durene and produce distillate. 4,347,397, Cl. 585-469.000.

Dwyer, Gregory J.: *See—*
Kauffman, Ivan L.; and Dwyer, Gregory J., 4,346,819, Cl. 222-41.000.

E.G.O. Elektro-Gerate Blanc u. Fischer: *See—*
Gossler, Gerhard, 4,347,432, Cl. 219-449.000.

E. & M. Lamort S.A.: *See—*
Barnscheidt, Wolfgang, 4,347,128, Cl. 209-170.000.

E-Systems, Inc.: *See—*
Alter, Larry D., 4,347,627, Cl. 455-136.000.

Eardley, David B., to International Business Machines Corporation. Reproduce only storage matrix. 4,347,585, Cl. 365-105.000.

Eary, George D., Sr. Adjustable upper body rest. 4,346,488, Cl. 5-436.000.

East, Sandra: *See—*
Challen, Ian A.; East, Sandra; and Sanderson, George R., 4,347,261, Cl. 426-573.000.

Eastman Kodak Company: *See—*
Kroll, Arthur S.; and Shuster, Frank A., 4,347,298, Cl. 430-97.000.
Limoges, Raymond F.; Scribani, Anthony A.; and Wilson, Robert J., 4,347,307, Cl. 430-338.000.

Eaton Corporation: *See—*
Bernett, Thomas B., 4,346,558, Cl. 60-527.000.
Bopp, Warren G., 4,346,797, Cl. 192-58.00B.
Chute, Richard; Larson, Jay M.; Tunnecliffe, Theodore N.; and Worthen, Roger P., 4,346,870, Cl. 251-356.000.
Coldren, Chester P., 4,347,024, Cl. 411-11.000.
Franz, Rudolph J., 4,346,729, Cl. 137-353.000.
Treadwell, William A., 4,346,775, Cl. 180-175.000.
Wojtecki, Rudolph G.; and Kaan, Joseph P., 4,347,433, Cl. 219-535.000.

Eaton Stamping Company: *See—*
White, Dale A.; Kluwe, Paul P.; and Greenwood, Leon D., 4,347,442, Cl. 290-48.000.

Eblen, Ewald; and Hofmann, Karl, to Robert Bosch GmbH. Fuel injection nozzle. 4,346,846, Cl. 239-533.300.

Eckberg, Richard P., to General Electric Company. Silicone release coatings and inhibitors. 4,347,346, Cl. 528-15.000.

Ecodyne Corporation: *See—*
Beckert, Adolf F.; Winberg, Dennis G.; and Nowlin, Duane D., 4,347,224, Cl. 422-277.000.

Edmondson, Robert A.: *See—*
Cole, Martin; and Edmondson, Robert A., 4,347,314, Cl. 435-43.000.

Ehemann, Gero, to Kurt Ehemann Spezialmaschinenfabrik KG. Apparatus and method for use in finish pressing. 4,346,826, Cl. 223-70.000.

Ehlers, Karsten: *See—*
Hofbauer, Peter; Ehlers, Karsten; and Heidemeyer, Paulus, 4,346,773, Cl. 180-165.000.

Ehrhardt, Gerry H.; and Carlson, Gene D., to Frye Copysystems, Inc. Chemical carbonless copy paper and transfer medium therefor. 4,347,282, Cl. 428-320.400.

Eichman, Larry W.: *See—*
Hardway, Jay B.; and Eichman, Larry W., 4,347,509, Cl. 340-778.000.

Ekholm, Ralf C., to Elevator GmbH. Lift battery control system. 4,346,789, Cl. 187-29.00R.

Electrohol Corporation: *See—*
Meshbesher, Thomas M., 4,347,109, Cl. 204-5.90R.

Elevator GmbH: *See—*
Ekholm, Ralf C., 4,346,789, Cl. 187-29.00R.

Ellenberger & Poensgen GmbH: *See—*
Krasser, Fritz, 4,347,494, Cl. 337-66.000.

Ellermann, Jurgen, to Mahle GmbH. Piston for internal combustion engines. 4,346,646, Cl. 92-220.000.

Elliott, Charles T., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Radiation detectors. 4,347,526, Cl. 357-30.000.

Elliott, Raymond D.: *See—*
Dick, Donald E.; Metz, Robert L.; RoJohn, D. Scott; and Elliott, Raymond D., 4,346,867, Cl. 248-424.000.

Elliott Turbomachinery Co., Inc.: *See—*
Gentilo, Dennis R.; Smith, Donald A.; and Pifer, David L., 4,347,427, Cl. 219-137.800.

Ellis, John S., to Her Majesty the Queen as represented by the Minister of National Defence of Her Majesty's Canadian Government. Lattice beam-columns. 4,346,539, Cl. 52-226.000.

Elmer, William B. Compound beam illuminating. 4,347,555, Cl. 362-299.000.

Elsner, Burckhardt; and Kirchbrucher, Rudiger, to Gewerkschaft Eisenhutte Westfalia. Mine roof supports. 4,347,021, Cl. 405-293.000.

Eltra Corporation: *See—*
Major, Jeffrey T.; Yard, LeRoy A.; and Holzscheiter, Danny B., 4,347,455, Cl. 310-239.000.

Elving, Robert L.: *See—*
Carlson, Randolph S., 4,347,461, Cl. 315-158.000.

Emhart Industries, Inc.: *See—*
Adams, Richard E.; and Stafford, Richard W., 4,347,493, Cl. 336-192.000.

Endo, Akira: *See—*
Hirota, Yukitsugu; Endo, Akira; Kimura, Katsuhiro; Morozumi, Hiroshi; and Sekine, Kenji, 4,346,774, Cl. 180-167.000.

Endo, Keiji: *See—*
Sato, Atsushi; Takahashi, Naoya; Endo, Keiji; and Yanagishita, Hitoshi, 4,347,169, Cl. 252-567.000.

Endo, Mitsuo: *See—*
Murofushi, Satoru; Shibuya, Tadao; Kato, Shinichi; and Endo, Mitsuo, 4,347,504, Cl. 340-638.000.

Engel, Pedro F.; and McCollum, Phillip A., to Hewlett-Packard Company. Apparatus for absorbing shocks to the ink supply of an ink jet printer. 4,347,524, Cl. 346-140.00R.

ens BIO LOGICALS Inc.: *See—*
Ogilvie, Kelvin K., 4,347,360, Cl. 544-276.000.

Enterra Corporation: *See—*
Norman, Edward C.; and Dowell, Howard A., 4,347,266, Cl. 427-154.000.

Environmental Institute of Michigan: *See—*
Dow, William G., 4,347,621, Cl. 376-139.000.

Enzian, Clayton T., Jr. Lifeboat. 4,346,664, Cl. 114-349.000.

Eppenbach, Lawrence C. Multiple function closure. 4,346,823, Cl. 222-443.000.

Epstein, David. Rackets. 4,346,891, Cl. 273-73.00C.

Epstein, Gordon L.: *See—*
Melin, John A.; Irwin, Russell P.; and Epstein, Gordon L., 4,346,968, Cl. 351-23.000.

Epstein, Ronald A.; and Mink, Robert I., to Stauffer Chemical Company. Titanium halide catalyst system. 4,347,160, Cl. 252-429.00B.

ERD, Inc.: *See—*
Evans, Vernon, 4,346,787, Cl. 185-37.000.

Erikson, Rolf B.: *See—*
Guenther, Kenneth L.; Kosner, Jerry J., Jr.; Erikson, Rolf B.; and Zemke, Edward H., 4,346,876, Cl. 271-11.000.

Erowa AG: *See—*
Schneider, Rudolf, 4,347,422, Cl. 219-69.00M.

Ertell, Carolyn A.: *See—*
Michel, Christian G.; Ertell, Carolyn A.; and Burk, Johst H., 4,347,325, Cl. 501-1.000.

Espenhahn, Manfred; and Folwaczny, Manfred, to Thyssen Aktiengesellschaft vorm. August Thyssen-Hutte. Electroplating apparatus. 4,347,115, Cl. 204-206.000.

Essemaeker, Paul: *See—*
De Ceuster, Jean; and Essemaeker, Paul, 4,347,099, Cl. 162-5.000.

Esterowitz, Leon; Allen, Roger E.; Kruer, Melvin R.; and Bartoli, Filbert J., to United States of America, Navy. Excimer-pumped blue-green laser. 4,347,485, Cl. 372-42.000.

Etablissement Liotte Representations Etrangeres: *See—*
Moll, Robert, 4,346,857, Cl. 242-84.300.

Etat Francais: *See—*
Chabrerie, Jean-Pierre, 4,347,456, Cl. 310-248.000.

Ethyl Corporation: *See—*
Tuvell, Melvin E., 4,347,381, Cl. 564-2.000.

Euteco Impianti S.p.A.: *See—*
Invernizzi, Renzo; Ligorati, Ferdinando; Fontanesi, Maurizio; and Catenacci, Roberto, 4,347,162, Cl. 252-429.00B.

Evans, Alfred C.; and Smilgys, Bruno S., to Veeder Industries, Inc. Readout mechanism for fuel pump counter. 4,347,435, Cl. 235-94.00R.

Evans, Robert F. Sensing impending sealed bearing and gage failure. 4,346,591, Cl. 73-151.000.

Evans, Vernon, to ERD, Inc. Energy recovery device. 4,346,787, Cl. 185-37.000.

Evenstad, Kenneth L.; and Nguyen, Hiep. Lower fatty acid glyceride high-HLB lubricating suppository and method for making and using the same. 4,347,237, Cl. 424-78.000.

Ex-Cell-O Corporation: *See—*
Czubak, Albin S., 4,346,534, Cl. 51-34.00A.
Kauffman, Ivan L.; and Dwyer, Gregory J., 4,346,819, Cl. 222-41.000.

Expandet: *See—*
Caille, Gilles E. A., 4,346,816, Cl. 220-306.000.

Extel Corporation: *See—*
Markus, Lawrence W.; Smejkal, George; and Lace, Melvin A., 4,346,854, Cl. 242-67.10R.

Exxon Research and Engineering Co.: *See—*
Baker, Richard H., 4,347,445, Cl. 307-255.000.
Bauman, Richard F.; Taunton, John W.; Anderson, George H.; Trachte, Ken L.; and Hsia, Steve J., 4,347,117, Cl. 208-8.0LE.
Diesel, Hans A., 4,346,609, Cl. 73-863.330.
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Funk, Edward W.; May, Walter G.; and Pirkle, James C., Jr., 4,347,118, Cl. 208-11.0LE.
Hou, Ching-Tsang; Patel, Ramesh N.; and Laskin, Allen I., 4,347,319, Cl. 435-123.000.
Mauldin, Charles H.; and Baird, William C., Jr., 4,347,123, Cl. 208-136.000.
Sherwood, Rexford D.; Baker, Rees T. K.; Derouane, Eric G.; and Pieters, Wim J., 4,347,063, Cl. 48-197.00R.

Falchi, Fiorino, to General Electric Company. Electric quick-break switch with forced opening of the contacts. 4,347,415, Cl. 200-154.000.

Falk, Hans: *See—*
Pohler, Friedmar; Falk, Hans; Muller, Josef; Klein, Hans J.; and Hoffacker, Franz, 4,346,668, Cl. 118-665.000.

Farcasiu, Malvina: *See—*
Whitehurst, Darrell D.; Mitchell, Thomas O.; and Farcasiu, Malvina, 4,347,116, Cl. 208-8.0LE.

Farge, Daniel; Le Roy, Pierre; Moutonnier, Claude; and Peyronel, Jean-Francois, to Rhone-Poulenc Industries. 1,2,4-Triazines. 4,347,359, Cl. 544-182.000.

Faubert, Guy, to Diaralux. Photographic developing tank. 4,346,979, Cl. 354-307.000.

Fechner, Erno H., to Ampex Corporation. Anti-static structure for magnetic tape guides. 4,347,549, Cl. 361-212.000.
Fehling, Ernst. Adjustably clampable motorcycle handlebar. 4,346,619, Cl. 74-551.100.
Fehrenbach, Hubert: *See*—
Hauck, Karl; Fehrenbach, Hubert; Mayer, Dieter; Wagner, Herbert; and Zwintzscher, Kurt, 4,347,091, Cl. 156-217.000.
Fekete, Dan H.; Scifres, Donald R.; and Streifer, William, to Xerox Corporation. Semiconductor injection laser for high speed modulation. 4,347,612, Cl. 372-50.000.
Feldman, Wilhelm: *See*—
Packschies, Heinz; Feldman, Wilhelm; and Hankel, Albert, 4,346,780, Cl. 181-198.000.
Feldmuhle Aktiengesellschaft: *See*—
Barnscheidt, Wolfgang, 4,347,128, Cl. 209-170.000.
Feller, Murray F., to Wilgood Corporation. Means and method for mounting temperature sensors. 4,346,864, Cl. 248-231.000.
Fenne, Ivor, to Lucas Industries Limited. Fuel injection nozzle unit. 4,346,841, Cl. 239-125.000.
Ferree, Herbert E., to Westinghouse Electric Corp. Tape wrapping apparatus. 4,346,550, Cl. 57-10.000.
Ferriss, Lincoln S., to Singer Company, The. Magnetic resonance gyro phase shifter. 4,347,480, Cl. 328-55.000.
Fertl, Walter H.; and DeVries, Marvin R., to Dresser Industries, Inc. Method for determining effective reservoir porosity. 4,346,592, Cl. 73-152.000.
Fiberglas Canada, Inc.: *See*—
Wilson, Keith E.; and Blackmore, Phillip W., 4,346,543, Cl. 52-404.000.
Field, Leslie A.: *See*—
Detz, Clifford M.; and Field, Leslie A., 4,347,394, Cl. 585-419.000.
Field, Thomas R.: *See*—
Jagodzinski, Peter F.; Field, Thomas R.; and Patrick, Carl D., 4,347,008, Cl. 400-208.000.
Fieldcrest Mills, Inc.: *See*—
Dale, Robert V., 4,347,273, Cl. 428-44.000.
Fields, Ellis K., to Standard Oil Company (Indiana). Production of mercaptans. 4,347,384, Cl. 568-37.000.
Figuereo, Blaise F. Extrusion vessel with controlled circular distribution of the extruded material. 4,347,050, Cl. 425-72.00R.
Filtrol Corporation: *See*—
Scherzer, Julius, 4,347,164, Cl. 252-455.00Z.
Findlay, John W. A.; Butz, Robert F.; and Welch, Richard M., to Burroughs Wellcome Co. Compounds and methods of making. 4,347,178, Cl. 260-112.00B.
Fischer, Hermann; Friese, Karl-Hermann; Gruber, Hans-Ulrich; Heinemann, Wolfgang; Knoll, Gunter; Linder, Ernst; Maurer, Helmut; Noack, Rainer; Steinke, Leo; Weber, Lothar; and Weyl, Helmut, to Robert Bosch GmbH. Oxygen content exhaust gas sensor, and method of its manufacture. 4,347,113, Cl. 204-195.00S.
Fives-Cail Babcock: *See*—
Lafosse, Jean R. M.; and Robert, Bernard J., 4,347,135, Cl. 210-208.000.
Flasza, Michael D.; and Rypkema, Jouke N., to Zenith Radio Corporation. Frequency and phase lock loop with separated AFC and phase locking. 4,347,483, Cl. 331-12.000.
Flautt, Martin C.; Wong, Robert; and Walsh, Joseph F., to Owens-Corning Fiberglas Corporation. Polytetrafluoroethylene fluorocarbon resin dispersion-containing coating composition for glass fibers, glass fibers, and glass fiber fabric coated therewith. 4,347,278, Cl. 428-288.000.
Flintab Vagsystem AB: *See*—
Persson, Per-olof G.; and Goterdal, Gote A., 4,346,771, Cl. 177-145.000.
Fluid Controls, Inc.: *See*—
Grawunde, Frederick G., 4,346,733, Cl. 137-493.000.
Fluorchem Inc.: *See*—
Baum, Kurt; Bedford, Clifford D.; and Hunadi, Ronald O., 4,347,376, Cl. 556-466.000.
FMC Corporation: *See*—
Glidden, Gregory L., 4,347,012, Cl. 403-2.000.
Michaelson, Robert C., 4,347,231, Cl. 423-584.000.
Michaelson, Robert C., 4,347,232, Cl. 423-584.000.
Fogel, Sidney J.: *See*—
Katz, Jerome; and Fogel, Sidney J., 4,346,490, Cl. 6-1.000.
Fohl, Timothy; and Bouchard, Andre C., to GTE Products Corporation. Photographic flash device using light-emitting pyrotechnic charges. 4,347,053, Cl. 431-359.000.
Folwaczny, Manfred: *See*—
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Fong, Dodd W.: *See*—
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Fontanesi, Maurizio: *See*—
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Forney Engineering Company: *See*—
Paredes, Candelario; and Slater, Billy R., 4,347,563, Cl. 364-137.000.
Fory, Werner: *See*—
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Fournell, Hans-Dieter: *See*—
Weishaupt, Walter; and Fournell, Hans-Dieter, 4,347,545, Cl. 361-172.000.
France, Paul W., to Post Office, The. Testing glass fibres. 4,346,601, Cl. 73-829.000.
Frank, Earl E., to Abex Corporation. Foundry molds. 4,346,751, Cl. 164-368.000.
Frank, Earl E., to Abex Corporation. Rail lubricator. 4,346,785, Cl. 184-3.00A.
Frank, John H., to Warner & Swasey Company, The. Locking device. 4,346,734, Cl. 137-506.000.
Frank, Reinhard, to Siemens Corporation. Central timer unit for buffering control data in a telecommunications system. 4,347,582, Cl. 364-900.000.
Franklin, Michael L., to Hoffmann-La Roche Inc. Background corrector for spectrochemical analyses of biological samples. 4,346,998, Cl. 356-307.000.
Franz, Rudolph J., to Eaton Corporation. Temperature control system and pushbutton controlled pneumatic actuator. 4,346,729, Cl. 137-353.000.
Fraser, Lawrence J.: *See*—
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Freeport Transport, Inc.: *See*—
Smetanick, Andrew, 4,346,905, Cl. 280-5.00C.
Friedland, Bernard, to Singer Company, The. Land-vehicle navigation system. 4,347,573, Cl. 364-453.000.
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Fischer, Hermann; Friese, Karl-Hermann; Gruber, Hans-Ulrich; Heinemann, Wolfgang; Knoll, Gunter; Linder, Ernst; Maurer, Helmut; Noack, Rainer; Steinke, Leo; Weber, Lothar; and Weyl, Helmut, 4,347,113, Cl. 204-195.00S.
Friesen, Henry; and Kizlyk, Mervin P., to Deere & Company. Parking stand for tractor-dismounted front loader. 4,347,031, Cl. 414-686.000.
Friesen, Neil; and Steiner, Urs. Bacteria static filter assembly. 4,347,136, Cl. 210-253.000.
Frister, Manfred; and Meyer, Friedhelm, to Robert Bosch GmbH. Rectifier circuit diode array and circuit protector. 4,347,543, Cl. 361-91.000.
Frye Copysystems, Inc.: *See*—
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Frye, Kenneth G., to Lenox Machine Company, Inc. Method of and means for handling paper sheets to be stacked. 4,346,881, Cl. 271-208.000.
Fryer, Rodney I.: *See*—
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Walser, Armin; and Fryer, Rodney I., 4,347,365, Cl. 546-256.000.
Fuji Photo Film Co., Ltd.: *See*—
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Ohara, Yuji, 4,347,523, Cl. 346-108.000.
Shiba, Keisuke; and Toyama, Tadao, 4,347,305, Cl. 430-302.000.
Takeuchi, Tetsuo; Mukunoki, Yasuo; and Minanizono, Junji, 4,347,308, Cl. 430-529.000.
Fuji-Thomson Co., Ltd.: *See*—
Inagaki, Masao; and Sato, Shigeru, 4,346,837, Cl. 236-34.500.
Fuji Xerox Co., Ltd.: *See*—
Kikuchi, Masatsugu; and Tamai, Masayoshi, 4,347,519, Cl. 346-75.000.
Fujikawa, Kanichi: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; Shigehara, Itaru; Nagatani, Kuniaki; and Nishimura, Shigeyuki, 4,347,390, Cl. 570-202.000.
Fujikawa, Tetsuzo, to Kawasaki Jukogyo Kabushiki Kaisha. Internal combustion engine with gas sealing device. 4,346,685, Cl. 123-193.00P.
Fujimoto, Takeo: *See*—
Inohara, Akio; Sawae, Kiyoshi; Kawaguchi, Hisao; and Fujimoto, Takeo, 4,347,074, Cl. 65-32.000.
Fujioka, Yoshiki: *See*—
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Fujita, Toyohisa: *See*—
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Obara, Haruki, 4,347,425, Cl. 219-69.00C.
Fujitsu Limited: *See*—
Fukushima, Toshitaka; Koyama, Kazumi; Ueno, Kouji; Kawabata, Yuichi; and Miyamura, Tamio, 4,347,584, Cl. 365-104.000.
Kaneda, Saburo; Tsuchimoto, Takamitsu; Shimizu, Kazuyuki; and Ikegami, Fujio, 4,347,565, Cl. 364-200.000.
Murano, Kazuo; Yamaguchi, Kazuo; Murakami, Norio; and Tsuda, Toshitaka, 4,347,617, Cl. 375-22.000.

Nakajima, Junzo; Hida, Masayuki; and Horie, Masakatsu, 4,346,982, Cl. 355-3.00R.
Sagawa, Masato; and Yamagishi, Wataru, 4,347,201, Cl. 264-24.000.
Takeda, Shiro; and Nakajima, Minoru, 4,347,306, Cl. 427-96.000.
Yokouchi, Kishio; Ogawa, Hiromi; Yokoyama, Hiromitsu; Kamehara, Nobuo; Niwa, Koichi; and Murakawa, Kyohei, 4,346,516, Cl. 29-845.000.

Fujiwara, Yasuo: *See—*
Kojima, Ichiro; Maruhashi, Kenji; and Fujiwara, Yasuo, 4,347,184, Cl. 260-314.000.

Fukao, Yasuyosi; and Mayumi, Hisaki, to Tokai Electric Wire Company Limited; and Toyota Jidosha Kogyo Kabushiki Kaisha. Electric connector. 4,346,957, Cl. 339-119.00R.

Fukaya, Hiroyasu: *See—*
Akiyama, Susumu; Ito, Kenzo; Fukaya, Hiroyasu; Ogiso, Haruhiko; Hirabayashi, Yuji; and Kawamura, Takahide, 4,347,570, Cl. 364-431.040.

Fukuda, Mitsutoshi: *See—*
Ohno, Shotaro; Koyama, Kenji; and Fukuda, Mitsutoshi, 4,347,138, Cl. 210-639.000.

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Fukushima Printing Industries Co., Ltd.: *See—*
Watanabe, Shinichiro, 4,347,094, Cl. 156-387.000.

Fukushima, Toshitaka; Koyama, Kazumi; Ueno, Kouji; Kawabata, Yuichi; and Miyamura, Tamio, to Fujitsu Limited. Programmable read-only memory device. 4,347,584, Cl. 365-104.000.

Fukutsu, Tsutomu: *See—*
Nakamura, Yoshiyuki; Matsubara, Seiichi; Matsui, Takashi; Kumagai, Taiji; Senga, Taizo; and Fukutsu, Tsutomu, 4,347,614, Cl. 373-77.000.

Fukuyama, Hiroomi; Isobe, Shinichi; Yonekura, Mikio; and Kataoka, Minoru, to Fujitsu Fanuc Limited. Method and system for transmission of serial data. 4,347,609, Cl. 371-34.000.

Funk, Edward W.; May, Walter G.; and Pirkle, James C., Jr., to Exxon Research & Engineering Co. Solvent extraction process for tar sands. 4,347,118, Cl. 208-11.0LE.

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Yasnitsky, Boris G.; Tsukanova, Galina M.; Oridoroga, Valentin A.; and Furmanov, Jury A., 4,347,056, Cl. 8-116.00R.
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Furrey, John H., to Motorola Inc. Engine knock signal processing circuit. 4,346,586, Cl. 73-35.000.

Fuse, Takeshi; and Sekine, Masaru, to NHK Spring Co., Ltd.; and NHK Precision Co., Ltd. Motion snubbing device. 4,346,793, Cl. 188-134.000.

Futcher, Steven; Gardener, John J.; and Hodgson, Victor F., to Imperial Chemical Industries Limited. Foam board having improved evenness and the method and apparatus for its continuous manufacture. 4,347,281, Cl. 428-318.400.

Futura Dental Products, Inc.: *See—*
Minkowitz, Arthur, 4,347,081, Cl. 75-157.500.

G.A.O. Gesellschaft fur Automation und Organisation mbH: *See—*
Bernardi, Herbert; and von Aschwege, Gerd, 4,346,851, Cl. 241-159.000.

G. D. Searle & Co.: *See—*
Mueller, Richard A., 4,347,192, Cl. 549-498.000.

G. L. Rexroth GmbH: *See—*
Wusthof, Peter; and Cunningham, Sinclair, 4,346,645, Cl. 91-501.000.

G & S Company: *See—*
Schmitt, Robert F., 4,346,541, Cl. 52-309.110.

Gaiser, Conrad J.: *See—*
Gaiser, Laurel A.; and Gaiser, Conrad J., 4,346,840, Cl. 239-6.000.

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Galloway, James H., to Oxy Metal Industries Corporation. Digital power converter trigger. 4,347,562, Cl. 363-87.000.

Gammell, Paul M., to United States of America, National Aeronautics and Space Administration. Hyperthermia heating apparatus. 4,346,715, Cl. 128-422.000.

Gamo, Gotaro: *See—*
Katsube, Hideo; Gamo, Gotaro; Nomura, Yoshiyuki; and Okuda, Kanemasa, 4,347,423, Cl. 219-69.00W.

Ganellin, Charon R.: *See—*
Durant, Graham J.; Ganellin, Charon R.; Owen, Geoffrey R.; and Young, Rodney C., 4,347,250, Cl. 424-263.000.

Gans, Wolfgang, to Daimler-Benz Aktiengesellschaft. Process for the separation of paint mists from the exhaust air of lacquer painting plants. 4,347,065, Cl. 55-6.000.

Ganster, Charles A.; and Nelson, Gerald V., to Texaco Inc. Feedstock temperature control system. 4,347,577, Cl. 364-501.000.

Ganyard, Ivan S.: *See—*
Krauss, Ferdinand A.; Ganyard, Ivan S.; and Sabbatis, Raymond E., 4,346,635, Cl. 83-479.000.

Gardener, John J.: *See—*
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Gardner, Harold S., to United States of America, Energy. Valve for abrasive material. 4,346,730, Cl. 137-375.000.

Gardner, Keith; Pike, Edward R.; and Hill, David W., to National Research Development Corporation. Method and apparatus for measuring retinal blood flow. 4,346,991, Cl. 356-28.500.

Gardner, Mickey R.: *See—*
Imig, Leland A.; and Gardner, Mickey R., 4,346,754, Cl. 374-46.000.

Garfield, Donald E.: *See—*
Gould, Larry D.; and Garfield, Donald E., 4,346,602, Cl. 73-842.000.

Garlung, Walther; and Dahl, Helge, to Total Transportation Systems (International) A/S. Device for use in welding reinforcement members to panel plates. 4,346,808, Cl. 212-212.000.

Garrett Corporation, The: *See—*
Corrigan, Charles E., 4,347,037, Cl. 416-97.00A.

Gary, Bruce L.: *See—*
United States of America, National Aeronautics and Space Administration; and Gary, Bruce L., 4,346,595, Cl. 73-178.00R.

Gary, Wardell; and Conroy, Ernest F., Jr., to Westinghouse Electric Corp. Solid-state load protection system having ground fault sensing. 4,347,540, Cl. 361-47.000.

Gatzi, Karl: *See—*
Lukaszczyk, Alfons; Martin, Henry; Diel, Peter J.; Fory, Werner; Gatzi, Karl; Kristinsson, Haukur; Muller, Beat; Muntwyler, Rene; Pachlatko, Johannes P.; Rempfler, Hermann; Schurter, Rolf; and Szczepanski, Henry, 4,347,372, Cl. 548-217.000.

Gaus, Ernst. Direct current motor with magnetic coupling. 4,347,453, Cl. 310-104.000.

Gaylo, Keith R.: *See—*
Scarton, Henry A.; Kennedy, Warren C.; Gaylo, Keith R.; and Caplan, Clark R., 4,346,783, Cl. 181-230.000.

Gebr. Bode & Co. GmbH: *See—*
Britzke, Ingo; Horn, Manfred; and Gossmann, Peter, 4,346,533, Cl. 49-28.000.

Geddes, Glenn F.: *See—*
Jeromin, Lothar S.; Geddes, Glenn F.; Baumann, Otto S.; and Santoro, Joseph F., 4,346,983, Cl. 355-3.00R.

Gefter, Evgeny L.: *See—*
Chernikhov, Alexei Y.; Yakovlev, Mikhail N.; Lysova, Valentina B.; Gefter, Evgeny L.; and Shmagina, Nina N., 4,347,348, Cl. 528-51.000.

Gehlhaus, Jurgen; and Kieser, Manfred, to Merck Patent Gesellschaft mit beschrankter Haftung. Photosensitive hydroxyalkylphenones. 4,347,111, Cl. 204-159.160.

Geiger, Paul B., to Hobart Corporation. Apparatus for a warewasher bypass soil collector. 4,346,723, Cl. 134-104.000.

Geiger, Robert J., to Singer Company, The. Simulator structure. 4,347,055, Cl. 434-30.000.

Geisslinger, Wolfgang; Pustka, Karel; Bronner, Hermann; Mullritter, Ludwig; and Vondrowski, Gabriel, to AGFA-Gevaert AG. Electromagnetically operated friction disk-free clutch. 4,346,616, Cl. 192-84.00C.

Gellert, Klaus; Nagel, Gunter; and Pollmeier, Franz J., to Siemens Aktiengesellschaft. Stator winding for an electric machine. 4,347,454, Cl. 310-193.000.

Gema AG Apparatebau: *See—*
Moos, Kurt, 4,346,732, Cl. 137-489.000.

Gemma, Mario; and Baehr, Burghard, to Ranco Incorporated. Defrosting control apparatus. 4,346,564, Cl. 62-140.000.

General Battery Corporation: *See—*
Kurpiewski, Joseph V., 4,346,874, Cl. 269-21.000.

General Defense Corporation: *See—*
Rodak, Edward, 4,346,653, Cl. 100-37.000.

General Electric Company: *See—*
Alley, Robert P.; Pohl, Walter J.; and Relyea, John W., 4,346,755, Cl. 165-17.000.
Bernatowicz, Henry; and Schoenig, Frederick C., Jr., 4,347,622, Cl. 376-245.000.
Dinger, Edward H., 4,347,469, Cl. 318-533.000.
Eckberg, Richard P., 4,347,346, Cl. 528-15.000.
Falchi, Fiorino, 4,347,415, Cl. 200-154.000.
Malm, Robert N., 4,347,556, Cl. 362-307.000.
McCarty, William J., 4,346,565, Cl. 62-151.000.
McCarty, William J.; Pohl, Walter J.; and McCreary, Russell L., 4,346,566, Cl. 62-159.000.
Olashaw, William F., 4,347,015, Cl. 403-219.000.
Park, John N.; and Steigerwald, Robert L., 4,347,464, Cl. 318-254.000.
Vandegraaf, Johannes J., 4,347,484, Cl. 331-25.000.
Will, Fritz G., 4,347,429, Cl. 219-288.000.
Williams, James W., 4,347,625, Cl. 455-17.000.

General Engineering Radcliffe 1979 Limited: *See—*
Hill, Alan H., 4,346,669, Cl. 118-733.000.

General Motors Corporation: *See—*
Brucken, Byron L.; and Hodits, Frank W., Jr., 4,347,046, Cl. 417-269.000.
Chraplyvy, Andrew R.; Herbst, Jan F.; and Croat, John J., 4,347,086, Cl. 148-101.000.
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Hebb, Edwin E., 4,346,598, Cl. 73-536.000.
Livers, Gerald D.; and Benedict, Frank L., 4,346,914, Cl. 280-735.000.
Merkle, Ralph H., 4,346,931, Cl. 296-148.000.
Miller, Carl E., 4,346,996, Cl. 356-243.000.
Rice, Hal H.; and Kruger, Gary A., 4,346,556, Cl. 60-272.000.
Rissi, Paul, 4,346,847, Cl. 239-585.000.

Shadman, Farhang; and Hegedus, Louis, 4,346,557, Cl. 60-311.000.
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Allen, John J., Jr.; and Shute, Bruce W., 4,347,569, Cl. 364-426.000.
Slama, William R.; Washburn, Robert B.; and Semanisin, Dale J., 4,347.277, Cl. 428-215.000.

Genieco Inc.: *See—*
Radkins, Andrew P.; Macarus, David P.; Radkins, James A.; and Waxman, Jay S., 4,347,217, Cl. 422-126.000.

Gentilman, Richard L.: *See—*
Maguire, Edward A.; and Gentilman, Richard L., 4,347,210, Cl. 264-294.000.

Gentilo, Dennis R.; Smith, Donald A.; and Pifer, David L., to Elliott Turbomachinery Co., Inc. Submerged arc welding gun. 4,347,427, Cl. 219-137.800.

Gentle, Thomas M.: *See—*
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GEOS Corporation: *See—*
Lau, Charles R.; Jensen, William; and Allen, Perrin A., 4,347,280, Cl. 428-304.400.

Gerb. Eickhoff Machinenfabrik und Eisengiesserei m.b.H.: *See—*
Krause, Rolf, 4,346,939, Cl. 299-45.000.

Gewerkschaft Eisenhutte Westfalia: *See—*
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Redder, Manfred; and Grundken, Dieter, 4,346,801, Cl. 198-500.000.

Gibson, Robert, to Siemens Medical Laboratories, Inc. Energy interlock system for a linear accelerator. 4,347,547, Cl. 361-187.000.

Giddings, Peter J.; John, David I.; and Thomas, Eric J., to Beecham Group Limited. Preparation of penicillanic acid derivatives. 4,347,182, Cl. 260-245.20R.

Giessen, Bill C.: *See—*
Ray, Ranjan; Polk, Donald E.; and Giessen, Bill C., 4,347,076, Cl. 75-0.50R.

Giguere, Edward L.; Kaiser, Paul H.; Campbell, Gordon M.; Hoffman, Peter F.; and Boutchyard, Hansford, Jr., to Diamond Shamrock Corporation. Occupational health/environmental surveillance. 4,347,568, Cl. 364-300.000.

Gill, Anthony; Gosden, John; and Parker, Robert W., to Reed International Limited. Drainage inspection chambers. 4,346,921, Cl. 285-110.000.

Gillies, George M., to British Nuclear Fuels Limited. Apparatus and method for metering and controlling a feed of hydrogen fluoride vapor. 4,346,673, Cl. 122-31.00R.

Gilman, David J.; Wardleworth, James M.; and Yellin, Tobias O., to Imperial Chemical Industries Ltd.; and ICI Americas Inc. Guanidine derivatives of imidazoles and thiazoles. 4,347,370, Cl. 548-193.000.

Ginter, Sally P.; Pawloski, Chester E.; and Stevens, Violete L., to Dow Chemical Co., The. Polyhydroxyl polyether compounds containing phosphorus. 4,347,194, Cl. 260-929.000.

Giobbio, Vincenzo; and Buracchi, Livio, to Pierrel S.p.A. Pharmacological preparation composed of a quinoxaline derivative mixed with sodium bicarbonate. 4,347,247, Cl. 424-250.000.

Giroux, Eugene L., to Richardson-Merrell Inc. Snake bite therapy. 4,347,255, Cl. 424-285.000.

Gist-Brocades N.V.: *See—*
Bruynes, Cornelis A., 4,347,358, Cl. 544-016.000.

Giusti, Paolo, to Anic, S.p.A. Method for preparing thermoelastomeric three-block copolymers. 4,347,340, Cl. 525-249.000.

Givaudan Corporation: *See—*
Kaiser, Roman; and Lamparsky, Dietmar, 4,347,190, Cl. 549-497.000.

Gladd, Joseph H.: *See—*
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Gladyshev, Georgy P.: *See—*
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Glandorf, Kaete: *See—*
Merkenich, Karl; Koch, Wilhelm; Glandorf, Kaete; Uhlmann, Gerd; and Scheurer, Guenther, 4,347,258, Cl. 426-334.000.

Glassman, Larry H.: *See—*
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Glidden, Gregory L., to FMC Corporation. Method and apparatus for tension setting and compression releasing tubular connectors. 4,347,012, Cl. 403-2.000.

Glinecke, Hermann R., to Globe Fire Equipment Company. Fusible link construction. 4,346,554, Cl. 59-93.000.

Gliniorz, Lothar: *See—*
Schoettle, Klaus; Dobler, Peter; Gliniorz, Lothar; and Hoffmann, Werner, 4,347,537, Cl. 360-132.000.

Global Marine Inc.: *See—*
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Globe Fire Equipment Company: *See—*
Glinecke, Hermann R., 4,346,554, Cl. 59-93.000.

Goebel, Franz; and Morgan, Cyril, to GTE Products Corporation. Electrochemical cell. 4,347,293, Cl. 429-105.000.

Goedert, Jean, to Arbed S.A. Process and apparatus for the desulfurizing of iron melts. 4,347,078, Cl. 75-51.000.

Goertler, Horst; Hetzel, Friedrich; Knobloch, Uwe; Muller, Hans; Prohaska, Hans; Rachner, Horst; and Spieth, Wolfgang, to ITT Industries, Inc. Circuit arrangement for power windows. 4,347,465, Cl. 318-266.000.

Goetze AG: *See—*
Vossieck, Paul, 4,346,684, Cl. 123-188.00S.

Goldstein, Theodore P., to Mobil Oil Corporation. Process for separating 1,4 cineoles from 1,8 cineoles. 4,347,189, Cl. 549-397.000.

Good, Charles H.: *See—*
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Goodnight, Hershel E.: *See—*
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Gordon Barlow Design: *See—*
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Gort, Alfred F.; and Moore, Charles E., to Hewlett-Packard Company. Surveying instrument. 4,346,989, Cl. 356-5.000.

Gosden, John: *See—*
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Gossler, Gerhard, to E.G.O. Elektro-Gerate Blanc u. Fischer. Glass ceramic cooking appliance. 4,347,432, Cl. 219-449.000.

Gossmann, Peter: *See—*
Britzke, Ingo; Horn, Manfred; and Gossmann, Peter, 4,346,533, Cl. 49-28.000.

Goterdal, Gote A.: *See—*
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Gotman, Alexander. Process for applying a thin coating in liquid form and subsequently drying it. 4,347,302, Cl. 430-270.000.

Goto, Takeshi; Kawakami, Noboru; Hirano, Itsuo; Itakura, Yoichi; and Kawahara, Yuji, to Toyo Soda Manufacturing Co., Ltd. Process for producing magnesium alloys. 4,347,077, Cl. 75-0.50B.

Goudsmit, Johan H. Dental-care device and brush body suitable therefor. 4,346,493, Cl. 15-104.930.

Gould Inc.: *See—*
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Gould, Larry D.; and Garfield, Donald E., to United States of America, Army. Apparatus and method for measuring adhesive bond strength. 4,346,602, Cl. 73-842.000.

GPG International Limited: *See—*
Upperton, Paul H., 4,346,805, Cl. 206-506.000.

Graham Magnetics, Inc.: *See—*
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Gramlich, Walter; Hoffmann, Werner; Hupfer, Leopold; Meissner, Bernd; and Paetsch, Juergen, to BASF Aktiengesellschaft. 3,6-Dimethyl-3-hydroxy-oct-1-ynes and -oct-1-enes, derivatives of these, and their use as scents, and in the preparation of 3,6-dimethyl-3-hydroxy-octane. 4,347,388, Cl. 568-840.000.

Grandeur Motorcar Corporation: *See—*
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Grawunde, Frederick G., to Fluid Controls, Inc. Control valve. 4,346,733, Cl. 137-493.000.

Greco, Saverio G.: *See—*
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Audeh, Costandi A.; and Greco, Saverio G., 4,347,226, Cl. 423-207.000.

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Greenhouse, Robert: *See—*
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Muchowski, Joseph M.; and Greenhouse, Robert, 4,347,187, Cl. 548-516.000.

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Greff, Richard J.: *See—*
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Gregorian, Razmic S.; and Namboodri, Chettoor G., to United Merchants & Manufacturers, Inc. Foam composition for treating textile materials and method of preparation. 4,347,145, Cl. 252-8.600.

Griffin, William T., to Automated Energy Systems, Inc. Power transmission apparatus. 4,346,621, Cl. 74-665.00G.

Grube, Herbert E.: *See—*
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Gruber, Hans-Ulrich: *See—*
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GTE Automatic Electric Labs Inc.: *See*—
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GTE Laboratories Incorporated: *See*—
Chen, Wen T.; and Oxley, Vincent C., 4,347,541, Cl. 361-50.000.
GTE Products Corporation: *See*—
Fohl, Timothy; and Bouchard, Andre C., 4,347,053, Cl. 431-359.000.
Goebel, Franz; and Morgan, Cyril, 4,347,293, Cl. 429-105.000.
Latassa, Frank M.; and Ray, John G., 4,347,460, Cl. 315-63.000.
Guell, Jose M. D., to Jumberca, S.A. Apparatus for knitting a single-faced pile fabric. 4,346,572, Cl. 66-93.000.
Guenther, Kenneth L.; Kosner, Jerry J., Jr.; Erikson, Rolf B.; and Zemke, Edward H., to Bell & Howell Company. Vacuum document feeder. 4,346,876, Cl. 271-11.000.
Gulf & Western Manufacturing Company: *See*—
Duttera, James; Jefferis, Raymond P., III; Matteson, David; and Szentlaszloi, Alexander, 4,347,127, Cl. 209-164.000.
McGarry, Phillip E.; and Herman, David E., 4,347,126, Cl. 209-164.000.
Smith, Joseph E., 4,347,014, Cl. 403-36.000.
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Gurr, George P.; Davis, John N.; and Wiggins, E. Thomas, to Sangamo Weston, Inc. System for controlling power distribution to customer loads. 4,347,575, Cl. 364-492.000.
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Haas, Werner, to Siemens Medical Laboratories, Inc. Filter arrangement for an x-ray apparatus. 4,347,440, Cl. 378-156.000.
Habib, Linda. Basket for stroller. 4,346,912, Cl. 280-644.000.
Habib, Pierre; and Luong, Minh P., to Institut Francais du Petrole. Anchoring system. 4,346,663, Cl. 114-295.000.
Haemers, Guy, to N.V. Bekaert S.A. Steel wire reinforcing elements. 4,347,290, Cl. 428-625.000.
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Haessler & DeWay Limited: *See*—
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Haessler, Wolfgang; and Slivar, Djuro, to Haessler & DeWay Limited. Conveyor. 4,346,803, Cl. 198-813.000.
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Hahn, Reinhard; and Behrens, Dieter, to Hermann C. Starck Berlin. Electrodes of sintered tantalum powder of fine grain size and process of production. 4,347,084, Cl. 75-245.000.
Halbach & Braun: *See*—
Braun, Ernst, 4,346,938, Cl. 299-43.000.
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Beck, Harold K., 4,346,770, Cl. 175-297.000.
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Wilke, Wilbur D.; Hodge, Archie A.; Belshaw, Thomas E.; and Hamblin, John R., 4,346,649, Cl. 99-337.000.
Hammond, William E. Knee support apparatus. 4,346,784, Cl. 182-230.000.
Handa, Hajime; Yonekawa, Yasuhiro; Yamagata, Sen; Taki, Waro; Ikada, Yoshito; and Iwata, Hiroo, to Kuraray Company, Ltd. Releasable balloon catheter. 4,346,712, Cl. 128-325.000.
Handotai Kenkyu Shinkokou: *See*—
Nishizawa, Jun-ichi, 4,347,097, Cl. 156-622.000.
Haney, Eugene A.; and Partus, Fred P., to Western Electric Company, Inc. Method of supplying fluid to a rotating tube. 4,347,069, Cl. 65-3.120.
Hankel, Albert: *See*—
Packschies, Heinz; Feldman, Wilhelm; and Hankel, Albert, 4,346,780, Cl. 181-198.000.
Hansen, Dale J.: *See*—
Bollinger, Frederic G.; D'Amico, John J.; and Hansen, Dale J., 4,347,075, Cl. 71-94.000.
Hansen, Ole: *See*—
Madsen, Rud F.; Nielsen, W. Kofod; and Hansen, Ole, 4,347,061, Cl. 44-51.000.
Hanson, Anthony, to Rodac Pneumatic Tools. Ratchet wrench. 4,346,630, Cl. 81-57.130.
Hanson, Bruce L.; and Wolvek, Sidney, to Datascope Corp. Balloon catheter with rotatable support. 4,346,698, Cl. 128-1.00D.
Hara, Takeshi; and Kayama, Yasutaka, to Teijin Limited. 8-Hydroxyhexahydronaphth[1',2':4,5]imidazo[2,1-b]thiazole and its derivatives. 4,347,369, Cl. 548-149.000.
Harada, Kazumasa: *See*—
Kawada, Ken; and Harada, Kazumasa, 4,346,852, Cl. 242-56.200.
Hardway, Jay B.; and Eichman, Larry W., to NCR Corporation. Plasma display with direct transformer drive apparatus. 4,347,509, Cl. 340-778.000.
Harmon, Zita T. K.; and Lindy, Lowell B., to Dow Chemical Company, The. Anti-clumping of ion exchange resins. 4,347,328, Cl. 521-28.000.
Harmony, Richard C., to Conservation Associates Incorporated. Aerated pulsating shower head. 4,346,844, Cl. 239-383.000.
Harr, Jost, to Sandoz Ltd. Fungicides. 4,347,253, Cl. 424-272.000.
Harris Corporation: *See*—
Nixon, Thomas J.; and Iley, Harold, 4,347,607, Cl. 370-110.100.
Harrison, Nelson K.; and Lamb, Dana B. Extrusion press and method. 4,346,578, Cl. 72-271.000.
Hart, Frederick E. Decorative article. 4,347,270, Cl. 428-13.000.
Harvey Hubbell Incorporated: *See*—
Herbert, Donald L., 4,346,795, Cl. 188-375.000.
Hasegawa, Yoshio: *See*—
Yajima, Seishi; Okamura, Kiyohito; Hasegawa, Yoshio; and Yamamura, Takemi, 4,347,347, Cl. 528-30.000.
Haselkorn, Michael H.; and Loudermilk, Dannie S., to Armco Inc. Insulative coatings for electrical steels. 4,347,085, Cl. 148-6.160.
Hashimoto, Kenji: *See*—
Inada, Masami; Ohumi, Takeharu; and Hashimoto, Kenji, 4,346,736, Cl. 137-625.480.
Hashizume, Masao; and Kitazawa, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. Multiplexed telecommunication systems. 4,347,605, Cl. 370-88.000.
Hass, Robert H.; and Albertson, Walter, to Union Oil Company of California. Process for removing SO_x and NO_x compounds from gas streams. 4,347,227, Cl. 423-235.000.
Hata, Kanji: *See*—
Makizawa, Yoshiaki; Yamamoto, Katsuyuki; and Hata, Kanji, 4,346,514, Cl. 29-740.000.
Hauck, Karl; Fehrenbach, Hubert; Mayer, Dieter; Wagner, Herbert; and Zwintzscher, Kurt, to BASF Aktiengesellschaft. Apparatus for the production of jackets for recording disks. 4,347,091, Cl. 156-217.000.
Haught, Alan F.: *See*—
Kesten, Arthur S.; and Haught, Alan F., 4,346,752, Cl. 165-1.000.
Hauni-Werke Korber & Co. KG: *See*—
Wochnowski, Waldemar; and Hohm, Reinhard, 4,346,524, Cl. 34-26.000.
Hauser, Donald P., to C. W. Zumbiel Company, The. Dispenser carton. 4,346,830, Cl. 225-49.000.
Hayashi, Masaharu; and Tsuchikawa, Sunzo, to Aisin Seiki Kabushiki Kaisha. Flexible blade fan. 4,347,038, Cl. 416-132.00A.
Hayashi, Yoshihiro, to Juichiro Ozawa. Membrane for reverse osmosis and method of making the same. 4,347,139, Cl. 210-654.000.
Haytayan, Harry M. Pneumatic fastening tools. 4,346,831, Cl. 227-8.000.
Headley, Peter; Kelsey, Thomas; and Murdy, John, to Northern Engineering Industries, Limited. Arc shorting device. 4,347,414, Cl. 200-144.00R.
Health Guardian Company: *See*—
Uyehara, Otto A., 4,347,503, Cl. 340-604.000.
Heath, Trevor C.: *See*—
Willis, John H.; and Heath, Trevor C., 4,347,071, Cl. 65-10.200.
Hebb, Edwin E., to General Motors Corporation. Cam actuated fuel modulating engine governor. 4,346,598, Cl. 73-536.000.
Heerens, Willem C.; and Peerbolte, Gerrit H. Capacitive gauge. 4,347,478, Cl. 324-61.00R.
Heersink, Evert J.: *See*—
Swanson, William C.; and Heersink, Evert J., 4,346,763, Cl. 172-2.000.
Hegedus, Louis: *See*—
Shadman, Farhang; and Hegedus, Louis, 4,346,557, Cl. 60-311.000.
Heger, Vernon G.; and Charmasson, Henri J. A. Area surveillance system. 4,347,590, Cl. 367-93.000.
Heidemeyer, Paulus: *See*—
Hofbauer, Peter; Ehlers, Karsten; and Heidemeyer, Paulus, 4,346,773, Cl. 180-165.000.
Heiermann, Siegfried, to Klockner-Werke AG. High-pressure seal in piston. 4,346,903, Cl. 277-58.000.
Heinemann, Wolfgang: *See*—
Fischer, Hermann; Friese, Karl-Hermann; Gruber, Hans-Ulrich; Heinemann, Wolfgang; Knoll, Gunter; Linder, Ernst; Maurer, Helmut; Noack, Rainer; Steinke, Leo; Weber, Lothar; and Weyl, Helmut, 4,347,113, Cl. 204-195.00S.
Heinze, Walter O.: *See*—
Albertassi, James H.; Heinze, Walter O.; and Landsman, Aaron, 4,347,142, Cl. 210-756.000.
Heki, Hideaki: *See*—
Sato, Hajime; Morisue, Tetsuo; and Heki, Hideaki, 4,347,214, Cl. 376-251.000.
Henckel, David J.; and Peters, Thomas E., to Morrison-Knudsen Forest Products Co., Inc. Method for production of directionally oriented lignocellulosic products, including means for cross-machine orientation. 4,347,202, Cl. 264-24.000.
Her Majesty the Queen: *See*—
Stirling, Leonard H., 4,346,510, Cl. 29-452.000.
Her Majesty the Queen as represented by the Minister of National Defence of Her Majesty's Canadian Government: *See*—
Ellis, John S., 4,346,539, Cl. 52-226.000.
Herbert, Donald L., to Harvey Hubbell Incorporated. Energy absorbing assembly. 4,346,795, Cl. 188-375.000.
Herbst, Jan F.: *See*—
Chraplyvy, Andrew R.; Herbst, Jan F.; and Croat, John J., 4,347,086, Cl. 148-101.000.

Herczog, Andrew, to Corning Glass Works. Sealing glasses for electrochemical, electrical, electronic, and optical applications. 4,347,295, Cl. 429-193.000.

Herman, David E.: *See*—
McGarry, Phillip E.; and Herman, David E., 4,347,126, Cl. 209-164.000.

Hermann Berstorff Maschinenbau GmbH: *See*—
Anders, Dietmar, 4,347,003, Cl. 366-75.000.

Hermann C. Starck Berlin: *See*—
Hahn, Reinhard; and Behrens, Dieter, 4,347,084, Cl. 75-245.000.

Hernandez, Rafael J.: *See*—
Stamets, Stanley L.; Winkless, Robert A.; Hernandez, Rafael J.; Merle, Joseph J.; and Payne, Robert D., 4,346,667, Cl. 118-622.000.

Herriott, Leslie V., to Lowe and Fletcher Limited. Releasable fastening device. 4,346,924, Cl. 292-129.000.

Hetzel, Friedrich: *See*—
Goertler, Horst; Hetzel, Friedrich; Knobloch, Uwe; Muller, Hans; Prohaska, Hans; Rachner, Horst; and Spieth, Wolfgang, 4,347,465, Cl. 318-266.000.

Heuck, Oran H. Pin-back button machine. 4,346,507, Cl. 29-243.520.

Hewlett-Packard Company: *See*—
Engel, Pedro F.; and McCollum, Phillip A., 4,347,524, Cl. 346-140.00R.
Gort, Alfred F.; and Moore, Charles E., 4,346,989, Cl. 356-5.000.
Kovalick, Albert, 4,347,434, Cl. 235-92.0SH.

Hibbs, Joseph E.; Chalmers, Gerald W.; and Teixeira, Walter J., to United States of America, Navy. Rocket motor arming-firing device FSU-12/B. 4,346,658, Cl. 102-254.000.

Hida, Masayuki: *See*—
Nakajima, Junzo; Hida, Masayuki; and Horie, Masakatsu, 4,346,982, Cl. 355-3.00R.

Hilaire, Fernand, to Captocap Limited. Pilfer-proof closure cap of plastic material. 4,346,811, Cl. 215-252.000.

Hilkene, John A. Cigarette extinguisher. 4,346,719, Cl. 131-236.000.

Hill, Alan H., to General Engineering Radcliffe 1979 Limited. Vacuum chamber seals. 4,346,669, Cl. 118-733.000.

Hill, David W.: *See*—
Gardner, Keith; Pike, Edward R.; and Hill, David W., 4,346,991, Cl. 356-28.500.

Hioki, Shunkichi, to Katoh Electrical Machinery Co., Ltd. Automatic tone arm returning device. 4,347,597, Cl. 369-231.000.

Hirabayashi, Yuji: *See*—
Akiyama, Susumu; Ito, Kenzo; Fukaya, Hiroyasu; Ogiso, Haruhiko; Hirabayashi, Yuji; and Kawamura, Takahide, 4,347,570, Cl. 364-431.040.

Hiraishi, Shigetoshi; and Matsushita, Toshihiko, to Mitsubishi Paper Mills, Ltd. Transfer-onto-plain paper type pressure-sensitive copying paper. 4,347,283, Cl. 428-320.800.

Hirano, Itsuo: *See*—
Goto, Takeshi; Kawakami, Noboru; Hirano, Itsuo; Itakura, Yoichi; and Kawahara, Yuji, 4,347,077, Cl. 75-0.50B.

Hiraoka & Co., Ltd.: *See*—
Tsutomu, Obayashi; and Mituo, Endou, 4,347,284, Cl. 428-328.000.

Hirato, Mizuho: *See*—
Kitaoka, Yoji; Hirato, Mizuho; and Miyatani, Kazuo, 4,347,223, Cl. 422-242.000.

Hirogohri, Ryoichi: *See*—
Takano, Hirotaka; Takahashi, Hideyuki; Hirogohri, Ryoichi; and Kato, Kohji, 4,347,396, Cl. 585-441.000.

Hirohata, Takashi: *See*—
Nishida, Takao; and Hirohata, Takashi, 4,347,172, Cl. 524-319.000.

Hirose, Tomoyoshi: *See*—
Ohtsuga, Hisao; Uzawa, Koji; Kamuro, Takashi; Sudo, Susumu; Hirose, Tomoyoshi; Miyao, Masafumi; and Koga, Motoyuki, 4,346,922, Cl. 285-109.000.

Hirota, Yukitsugu; Endo, Akira; Kimura, Katsuhiro; Morozumi, Hiroshi; and Sekine, Kenji, to Hitachi, Ltd.; and Nissan Motor Co., Ltd. Doppler radar mounting structure for motor vehicles. 4,346,774, Cl. 180-167.000.

Hirsch, Martin: *See*—
Reh, Lothar; Hirsch, Martin; Baron, Gerhard; Blaum, Eberhard; and Hafke, Carl, 4,347,064, Cl. 48-197.00R.

Hirschinger, Lothar: *See*—
Weber, Kurt; Rutsch, Peter; and Hirschinger, Lothar, 4,347,276, Cl. 428-160.000.

Hitachi, Ltd.: *See*—
Hirota, Yukitsugu; Endo, Akira; Kimura, Katsuhiro; Morozumi, Hiroshi; and Sekine, Kenji, 4,346,774, Cl. 180-167.000.
Ito, Hiroko; Ohira, Eiji; and Ichikawa, Akira, 4,347,408, Cl. 179-84.0VF.
Kenma, Shigeyuki, 4,347,196, Cl. 261-39.00B.
Miyashita, Kunio; Takahashi, Tadashi; and Morinaga, Shigeki, 4,347,536, Cl. 360-107.000.
Sakurai, Hideki; Nakatani, Mitsuo; Oka, Hitoshi; Yokono, Hitoshi; and Isogai, Tokio, 4,347,304, Cl. 430-291.000.
Sugano, Akira; and Tooyama, Eiji, 4,347,564, Cl. 364-132.000.
Tosaki, Hiromi; Arima, Hideo; Mozume, Teruo; Ikegami, Akira; Isogai, Tokio; and Tsubokawa, Ichiro, 4,347,166, Cl. 252-519.000.
Watanabe, Ryuji; and Kuniya, Keiichi, 4,347,413, Cl. 200-144.00B.

Hlaban, James J.; Grube, Herbert E.; and Woon, Paul S., to Kimberly-Clark Corporation. Panty liner. 4,347,092, Cl. 156-227.000.

Hobart Corporation: *See*—
Geiger, Paul B., 4,346,723, Cl. 134-104.000.

Hodge, Archie A.: *See*—
Wilke, Wilbur D.; Hodge, Archie A.; Belshaw, Thomas E.; and Hamblin, John R., 4,346,649, Cl. 99-337.000.

Hodgson, Victor F.: *See*—
Futcher, Steven; Gardener, John J.; and Hodgson, Victor F., 4,347,281, Cl. 428-318.400.

Hodits, Frank W., Jr.: *See*—
Brucken, Byron L.; and Hodits, Frank W., Jr., 4,347,046, Cl. 417-269.000.

Hoechst Aktiengesellschaft: *See*—
Bodenbenner, Kurt; Perkow, Helmut; and Vollmuller, Helmut, 4,347,144, Cl. 210-761.000.
Staendeke, Horst; Dany, Franz-Josef; and Kandler, Joachim, 4,347,334, Cl. 524-416.000.

Hoechst Fibers Industries: *See*—
Birk, Manfred O.; Piesczek, Wolfgang A.; and Little, Brian E., 4,346,504, Cl. 28-240.000.

Hofbauer, Peter; Ehlers, Karsten; and Heidemeyer, Paulus, to Volkswagenwerk Aktiengesellschaft. Apparatus for operating a motor vehicle. 4,346,773, Cl. 180-165.000.

Hoffacker, Franz: *See*—
Pohler, Friedmar; Falk, Hans; Muller, Josef; Klein, Hans J.; and Hoffacker, Franz, 4,346,668, Cl. 118-665.000.

Hoffman, Peter F.: *See*—
Giguere, Edward L.; Kaiser, Paul H.; Campbell, Gordon M.; Hoffman, Peter F.; and Boutchyard, Hansford, Jr., 4,347,568, Cl. 364-300.000.

Hoffmann, Kurt; and Zapf, Karl J., to Siemens Aktiengesellschaft. MOS-Integrated circuit arrangement for suppressing quiescent currents flowing in word line drivers of semiconductor memories. 4,347,588, Cl. 365-206.000.

Hoffmann-La Roche Inc.: *See*—
Franklin, Michael L., 4,346,998, Cl. 356-307.000.
Walser, Armin; and Fryer, Rodney I., 4,347,364, Cl. 546-256.000.
Walser, Armin; and Fryer, Rodney I., 4,347,365, Cl. 546-256.000.

Hoffmann, Werner: *See*—
Gramlich, Walter; Hoffmann, Werner; Hupfer, Leopold; Meissner, Bernd; and Paetsch, Juergen, 4,347,388, Cl. 568-840.000.
Schoettle, Klaus; Dobler, Peter; Gliniorz, Lothar; and Hoffmann, Werner, 4,347,537, Cl. 360-132.000.

Hofmann, Karl: *See*—
Eblen, Ewald; and Hofmann, Karl, 4,346,846, Cl. 239-533.300.

Hofmann, Otto; Kroy, Walter; and Nave, Peter, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Precision navigation apparatus. 4,347,511, Cl. 343-5.0PC.

Hohm, Reinhard: *See*—
Wochnowski, Waldemar; and Hohm, Reinhard, 4,346,524, Cl. 34-26.000.

Hokama, Yosh, to International Beauty Distributors, Inc. Clamp-on artificial fingernail. 4,346,720, Cl. 132-73.000.

Holdsworth, Timothy M., to Carrier Corporation. Motor compressor unit and a method of reducing noise transmitted therefrom. 4,347,042, Cl. 417-53.000.

Holdt, Donald H.; and Morgan, Donald B., to Whittaker Medical Manufacturing Company. Quick release manual type Fowler for hospital stretchers. 4,346,487, Cl. 5-74.00R.

Hollander, Anne M.: *See*—
Holmes, David L.; and Hollander, Anne M., 4,347,502, Cl. 340-545.000.

Hollandse Signaalapparaten B.V.: *See*—
Langeraar, Huibert B., 4,347,592, Cl. 367-137.000.

Holliday, John T., Jr. Steam injection system for engines. 4,346,675, Cl. 123-25.00P.

Hollingsbee, Derek A., to Smith & Nephew Associated Companies Limited. Autoclavable emulsion containing silver sulphadiazine. 4,347,238, Cl. 424-81.000.

Hollowell, William M.; and Ziv, Avraham, to American Safety Equipment Corporation. External release for reduced tension mechanism. 4,346,858, Cl. 242-107.000.

Holman, Rury R.: *See*—
Turner, Robert C.; and Holman, Rury R., 4,346,613, Cl. 73-864.510.

Holmes, Brian: *See*—
Bennett, John D.; Holmes, Brian; and Morton, David C., 4,346,800, Cl. 198-412.000.

Holmes, David L.; and Hollander, Anne M., to Johnson Pet-Dor, Inc. Early warning electrical sound alarm system for pet door structure. 4,347,502, Cl. 340-545.000.

Holmes, Lawrence, Jr. Light analyzing lenticular screen for viewing stereo images. 4,346,962, Cl. 350-128.000.

Holzscheiter, Danny B.: *See*—
Major, Jeffrey T.; Yard, LeRoy A.; and Holzscheiter, Danny B., 4,347,455, Cl. 310-239.000.

Homan, Gary R.; and Romig, Charles A., to Dow Corning Corporation. Heat cured silicone elastomer. 4,347,336, Cl. 524-731.000.

Homer, Arthur J., to Marrett Manufacturing (Proprietary) Limited. Gas scrubber with plural vertical liquid inlets. 4,347,067, Cl. 55-227.000.

Hon, Frank: *See*—
Afonso, Adriano; and Hon, Frank, 4,347,183, Cl. 260-245.20R.

Honaga, Susumu: *See*—
Kawabata, Minoru; Honaga, Susumu; and Inaguma, Yoshiharu, 4,347,048, Cl. 417-310.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Noritake, Yutaka; Kajitani, Ikuo; Arai, Sakuji; and Muto, Toshiaki, 4,347,219, Cl. 422-180.000.
Ogawa, Kouhei, 4,347,195, Cl. 261-18.00R.

Osada, Isao; and Sano, Shoichi, 4,346,747, Cl. 152-158.000.

Honeywell Inc.: *See—*
Kensinger, Robert A.; and Norman, Robert N., 4,347,576, Cl. 364-493.000.
Whitney, John M., 4,347,443, Cl. 307-117.000.

Honeywell Information Systems Inc.: *See—*
Karcher, DeWayne E., 4,346,817, Cl. 221-312.00R.
Speraggi, Marcello, 4,346,883, Cl. 271-274.000.

Hood, Charles B., to CVI Incorporated. Super critical helium refrigeration process and apparatus. 4,346,563, Cl. 62-117.000.

Hoogeveen, Jacobus, to U.S. Philips Corporation. Method of frame synchronization of a digital TDM communication system and arrangement for performing the method. 4,347,606, Cl. 370-105.000.

Hoogstraat, Herman M. Method and apparatus for determining the hydrogen content of a gas. 4,346,583, Cl. 73-19.000.

Hooker Chemicals & Plastics Corp.: *See—*
Teichmann, Robert J.; and Mayer, Linda J., 4,347,107, Cl. 204-44.000.

Hooper, David C.; Johnson, George A.; Peter, Donald; and Rennie, George K., to Lever Brothers Company. Deodorant abrasive cleaner for surface treatment. 4,347,153, Cl. 252-174.250.

Hoover, Mervyn C., Jr., to United States of America, Navy. Radar radiometer and its use. 4,347,515, Cl. 343-100.0ME.

Hoover Universal, Inc.: *See—*
Jacobs, Ronald E., 4,346,933, Cl. 297-89.000.

Horie, Masakatsu: *See—*
Nakajima, Junzo; Hida, Masayuki; and Horie, Masakatsu, 4,346,982, Cl. 355-3.00R.

Horn, Manfred: *See—*
Britzke, Ingo; Horn, Manfred; and Gossmann, Peter, 4,346,533, Cl. 49-28.000.

Horner, Patrick J.; and Rashbrook, Robert B., to Imperial Chemical Industries Limited. Polyester compositions containing residues of dihydroxyalkoxy coumarins. 4,347,350, Cl. 528-190.000.

Hosaka, Kiyokazu: *See—*
Takagi, Takeji; and Hosaka, Kiyokazu, 4,347,204, Cl. 264-127.000.

Hoshino, Masao, to Hoshino Musical Instrument, Manufacturing Co., Ltd. Foot operated drum pedal. 4,346,638, Cl. 84-422.00R.

Hoshino Musical Instrument, Manufacturing Co., Ltd.: *See—*
Hoshino, Masao, 4,346,638, Cl. 84-422.00R.

Hosoe, Kazuya: *See—*
Kawabata, Takashi; Tsunekawa, Tokuichi; Hosoe, Kazuya; Kinoshita, Takao; Sakai, Shinji; and Taguchi, Tatsuya, 4,346,970, Cl. 354-25.000.

Hou, Ching-Tsang; Patel, Ramesh N.; and Laskin, Allen I., to Exxon Research & Engineering Co. Microbiological epoxidation process. 4,347,319, Cl. 435-123.000.

Houghton, Ronald. Variable pitch screw propeller. 4,347,039, Cl. 416-167.000.

Houle, Raymond T.: *See—*
Reed, Stewart D.; Sills, Arthur A.; Kraft, John H.; Houle, Raymond T.; Redwine, Michael A.; and Kilbourn, Frederick A., 4,346,485, Cl. 4-555.000.

Howard-Leicester, Michael; Gundacker, Siegbert; and Moffatt, Larry J., to Howard-Leicester, Michael. Vapor generator with cycling monitoring of conductivity. 4,347,430, Cl. 219-295.000.

Howells, Anthony P. S.; Viswanathan, Raman; and Angehrn, Jorg A., to Dresser Industries, Inc. Well logging correction method and apparatus. 4,346,593, Cl. 73-152.000.

Hsia, Steve J.: *See—*
Bauman, Richard F.; Taunton, John W.; Anderson, George H.; Trachte, Ken L.; and Hsia, Steve J., 4,347,117, Cl. 208-8.0LE.

Hubby, John S., to Phillips Petroleum Company. Solvent vapor recovery from a polymer solution. 4,347,098, Cl. 159-16.00S.

Hughes Aircraft Company: *See—*
Taylor, Peter F.; Tuchyner, Harold J.; Basiulis, Algerd; and Lamp, Thomas R., 4,346,643, Cl. 89-14.100.

Huijnen, Wilhelmus G. J., to Occidental Oil Shale, Inc. Method for fragmenting oil shale formation. 4,346,935, Cl. 299-2.000.

Huijsman, Adam: *See—*
Sep, Walterus J.; and Huijsman, Adam, 4,347,170, Cl. 523-511.000.

Hunadi, Ronald O.: *See—*
Baum, Kurt; Bedford, Clifford D.; and Hunadi, Ronald O., 4,347,376, Cl. 556-466.000.

Hundeby, David R., to Macdon Industries. Transport mechanism for single and multiple unit pull type implements. 4,346,909, Cl. 280-411.00C.

Hunt, Alan B.: *See—*
Schomer, Paul D.; and Hunt, Alan B., 4,347,410, Cl. 179-175.10A.

Hunter, Donald N.; and Brook, Richard J., to Rosemount Engineering Company Limited. Method of detecting oxygen and an oxygen sensor therefor. 4,347,495, Cl. 338-34.000.

Hunter Wire Products Limited: *See—*
Rutherford, William, 4,347,129, Cl. 209-399.000.

Hupfer, Leopold: *See—*
Gramlich, Walter; Hoffmann, Werner; Hupfer, Leopold; Meissner, Bernd; and Paetsch, Juergen, 4,347,388, Cl. 568-840.000.

Huss, Albin, Jr.: *See—*
Dwyer, Francis G.; and Huss, Albin, Jr., 4,347,397, Cl. 585-469.000.

I. W. Industries, Inc.: *See—*
Warshawsky, Jerome, 4,347,557, Cl. 362-427.000.

Ichikawa, Akira: *See—*
Ito, Hiroko; Ohira, Eiji; and Ichikawa, Akira, 4,347,408, Cl. 179-84.0VF.

ICI Americas Inc.: *See—*
Gilman, David J.; Wardleworth, James M.; and Yellin, Tobias O., 4,347,370, Cl. 548-193.000.

Ideal Toy Corporation: *See—*
Cooper, Julius; and Tilbor, Neil, 4,346,894, Cl. 273-86.00B.
Zeno, John R.; and Rosenhagen, William, 4,346,640, Cl. 84-464.00R.

Iidaka, Toshiharu: *See—*
Iwata, Hidefumi; Tuchiya, Yoshimasa; and Iidaka, Toshiharu, 4,346,932, Cl. 296-216.000.

Ikada, Yoshito: *See—*
Handa, Hajime; Yonekawa, Yasuhiro; Yamagata, Sen; Taki, Waro; Ikada, Yoshito; and Iwata, Hiroo, 4,346,712, Cl. 128-325.000.

Ikeda, Nobuo; Tanaka, Junzo; and Yoshimura, Hirofumi, to Matsushita Electric Industrial Co., Ltd. Microwave seal structure in microwave oven. 4,347,420, Cl. 219-10.55D.

Ikeda, Shigeho: *See—*
Yoshimura, Minoru; Takenaka, Yoshihiro; Ikeda, Shigeho; and Yoshii, Hiroe, 4,347,317, Cl. 435-110.000.

Ikedo, Yuji: *See—*
Abe, Kunio; Saito, Masatsugu; Ono, Masao; and Ikedo, Yuji, 4,347,596, Cl. 369-72.000.

Ikegami, Akira: *See—*
Tosaki, Hiromi; Arima, Hideo; Mozume, Teruo; Ikegami, Akira; Isogai, Tokio; and Tsubokawa, Ichiro, 4,347,166, Cl. 252-519.000.

Ikegami, Fujio: *See—*
Kaneda, Saburo; Tsuchimoto, Takamitsu; Shimizu, Kazuyuki; and Ikegami, Fujio, 4,347,565, Cl. 364-200.000.

Ikeguchi, Eiji: *See—*
Yamauchi, Junichi; Shibatani, Kyoichiro; Ikeguchi, Eiji; Omura, Ikuo; and Nagase, Yoshinori, 4,347,233, Cl. 424-7.000.

Ikumoto, Takeshi: *See—*
Touyama, Ryousuke; Inouye, Hiroyuki; Shingu, Tetsuro; Takeda, Yoshio; Ikumoto, Takeshi; Okuyama, Hidetoshi; and Yamamoto, Osamu, 4,347,356, Cl. 542-430.000.

Iley, Harold: *See—*
Nixon, Thomas J.; and Iley, Harold, 4,347,607, Cl. 370-110.100.

Illinois Tool Works Inc.: *See—*
Brindle, Brian, 4,347,027, Cl. 411-387.000.

Imahashi, Issei, to Telmec Co., Ltd. Micro-displacement device. 4,347,452, Cl. 310-76.000.

Imamura, Shigeyuki; Matsumoto, Tohru; Muto, Naoki; and Misaki, Hideo, to Toyo Jozo Kabushiki Kaisha. Glycerol kinase from *Streptomyces canus*. 4,347,323, Cl. 435-194.000.

IMED Corporation: *See—*
Cannon, Raymond E.; Jenkins, Jon A.; and Wilson, Larry L., 4,346,606, Cl. 73-861.410.

Imig, Leland A.; and Gardner, Mickey R., to United States of America, National Aeronautics and Space Administration. Heating and cooling system. 4,346,754, Cl. 374-46.000.

Imperial Chemical Industries Limited: *See—*
Futcher, Steven; Gardener, John J.; and Hodgson, Victor F., 4,347,281, Cl. 428-318.400.
Gilman, David J.; Wardleworth, James M.; and Yellin, Tobias O., 4,347,370, Cl. 548-193.000.
Horner, Patrick J.; and Rashbrook, Robert B., 4,347,350, Cl. 528-190.000.

Inaba, Hajimu, to Fujitsu Fanuc Limited. Industrial robot control system. 4,347,578, Cl. 364-513.000.

Inada, Masami; Ohumi, Takeharu; and Hashimoto, Kenji, to Aisin Seiki Kabushiki Kaisha. Electrically operated fluid control valve unit. 4,346,736, Cl. 137-625.480.

Inagaki, Masao; and Sato, Shigeru, to Toyota Jidosha K.K.; and Fuji-Thomson Co., Ltd. Thermostat for controlling the flow of cooling water of an engine. 4,346,837, Cl. 236-34.500.

Inaguma, Yoshiharu: *See—*
Kawabata, Minoru; Honaga, Susumu; and Inaguma, Yoshiharu, 4,347,048, Cl. 417-310.000.

Inframetrics, Inc.: *See—*
Stetson, Norman B., 4,347,530, Cl. 358-113.000.

Ingard, Karl U.; and Patrick, William P., to Massachusetts Institute of Technology. Lined-duct acoustic filter. 4,346,781, Cl. 181-206.000.

Innis, Robert T.: *See—*
Peterson, Charles A.; and Innis, Robert T., 4,347,539, Cl. 361-16.000.

Inohara, Akio; Sawae, Kiyoshi; Kawaguchi, Hisao; and Fujimoto, Takeo, to Sharp Kabushiki Kaisha. Sealing technique for semiconductor devices. 4,347,074, Cl. 65-32.000.

Inokuma, Shun: *See—*
Katsube, Junki; Shimomura, Hiromi; Inokuma, Shun; and Sugie, Akihiko, 4,347,254, Cl. 424-275.000.

Inoue, Nobuyoshi: *See—*
Saito, Toshihisa; and Inoue, Nobuyoshi, 4,346,974, Cl. 354-154.000.

Inouye, Hiroyuki: *See—*
Touyama, Ryousuke; Inouye, Hiroyuki; Shingu, Tetsuro; Takeda, Yoshio; Ikumoto, Takeshi; Okuyama, Hidetoshi; and Yamamoto, Osamu, 4,347,356, Cl. 542-430.000.

Institut Francais du Petrole: *See—*
Born, Maurice; Briquet, Lucienne; and de Gaudemaris, Gabriel, 4,347,062, Cl. 44-68.000.
Cosyns, Jean; Durand, Daniel; and Leger, Gerard, 4,347,392, Cl. 585-259.000.
Habib, Pierre; and Luong, Minh P., 4,346,663, Cl. 114-295.000.

International Beauty Distributors, Inc.: *See—*
Hokama, Yosh, 4,346,720, Cl. 132-73.000.

International Business Machines Corporation: *See*—
Brown, Clifford G., 4,347,009, Cl. 400-611.000.
Cullet, Rene, 4,347,479, Cl. 324-64.000.
Eardley, David B., 4,347,585, Cl. 365-105.000.
Jagodzinski, Peter F.; Field, Thomas R.; and Patrick, Carl D., 4,347,008, Cl. 400-208.000.
Lee, Robert P.; and Closs, Felix H., 4,347,498, Cl. 340-825.020.
Schaefer, John O., 4,347,007, Cl. 400-208.000.
Scranton, Robert A., 4,347,583, Cl. 365-87.000.
Shakib, Iraj D., 4,347,006, Cl. 400-187.000.

International Harvester Co.: *See*—
Swanson, William C.; and Heersink, Evert J., 4,346,763, Cl. 172-2.000.

International Octrooi Maatischappit "Octropa" B.V.: *See*—
Challen, Ian A.; East, Sandra; and Sanderson, George R., 4,347,261, Cl. 426-573.000.

International Standard Electric Corporation: *See*—
Blomley, Peter F., 4,347,407, Cl. 179-81.00R.

International Water Saving Systems, Inc.: *See*—
Albertassi, James H.; Heinze, Walter O.; and Landsman, Aaron, 4,347,142, Cl. 210-756.000.

Internationale Octrooi Maatschappij "Octropa" B.V.: *See*—
Sep, Walther us J.; and Huijsman, Adam, 4,347,170, Cl. 523-511.000.

Interox Chemicals Limited: *See*—
Smith, Eileen; Timperley, Doreen A.; and Titchener, Dorothy M., 4,347,149, Cl. 252-102.000.

Invernizzi, Renzo; Ligorati, Ferdinando; Fontanesi, Maurizio; and Catenacci, Roberto, to Euteco Impianti S.p.A. Catalyst for the polymerization of alpha-olefins. 4,347,162, Cl. 252-429.00B.

Irwin, Russell P.: *See*—
Melin, John A.; Irwin, Russell P.; and Epstein, Gordon L., 4,346,968, Cl. 351-23.000.

Isailovic, Jordan: *See*—
Dakin, Wayne R.; and Isailovic, Jordan, 4,347,619, Cl. 375-37.000.

Ishida, Tokuji: *See*—
Taniguchi, Nobuyuki; Nakai, Masaaki; Ishida, Tokuji; and Uchida, Isamu, 4,346,978, Cl. 354-289.000.

Ishidoshiro, Hiroshi: *See*—
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,346,503, Cl. 28-155.000.

Ishigaki, Yukinobu; and Ozaki, Hideaki, to Victor Company of Japan, Ltd. Apparatus for automatic selective switching and transmission of input signals. 4,347,510, Cl. 340-825.500.

Ishihama, Satoshi; Miyoshi, Taisuke; and Iwasa, Koji, to Kabushiki Kaisha Daini Seikosha. Electrochromic display device. 4,346,964, Cl. 350-357.000.

Ishihara Sangyo Kaisha Ltd.: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; Shigehara, Itaru; Nagatani, Kuniaki; and Nishimura, Shigeyuki, 4,347,390, Cl. 570-202.000.

Ishihara, Shunichi; Kitajima, Nobuo; Nishigaki, Yuji; and Kitahara, Nobuko, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member and electrophotographic process. 4,347,296, Cl. 430-42.000.

Ishihara, Shunichi; Kitajima, Nobuo; Nishigaki, Yuji; and Kitahara, Nobuko, to Canon Kabushiki Kaisha. Electrophotographic method and element. 4,347,297, Cl. 430-42.000.

Ishii, Daido; and Konishi, Hideki, to Japan Spectroscopic Co., Ltd. Device for introducing micro amount of sample into an analyzing apparatus. 4,346,610, Cl. 73-863.730.

Ishizuka Glass Co., Ltd.: *See*—
Nagaoka, Kinnosuke; Kato, Tsumugu; and Nozawa, Mitsuru, 4,347,072, Cl. 65-27.000.

Ishizuka, Takashi; Moriyama, Yasuhiro; and Nakamura, Masao, to Nitto Electric Industrial Co., Ltd. Heat fusible polyimide compound films and process for producing the same. 4,347,286, Cl. 428-349.000.

Iso, Basaric. Console traffic direction post. 4,346,666, Cl. 116-63.00R.

Iso, Tadashi: *See*—
Iwao, Jun-ichi; Oya, Masayuki; and Iso, Tadashi, 4,347,371, Cl. 548-201.000.

Isobe, Shinichi: *See*—
Fukuyama, Hiroomi; Isobe, Shinichi; Yonekura, Mikio; and Kataoka, Minoru, 4,347,609, Cl. 371-34.000.

Isogai, Tokio: *See*—
Sakurai, Hideki; Nakatani, Mitsuo; Oka, Hitoshi; Yokono, Hitoshi; and Isogai, Tokio, 4,347,304, Cl. 430-291.000.
Tosaki, Hiromi; Arima, Hideo; Mozume, Teruo; Ikegami, Akira; Isogai, Tokio; and Tsubokawa, Ichiro, 4,347,166, Cl. 252-519.000.

Isono, Tadao, to Osawa Precision Industries, Ltd. Multiple control system for camera. 4,346,975, Cl. 354-195.000.

Isshiki, Tomiya; Tomita, Tetsuo; Sakaguchi, Shuzabu; Kohzaki, Toshiaki; Aoki, Osamu; Takeda, Norio; and Aoki, Yoshiyuki, to Mitsubishi Gas Chemical Company, Inc. Process for producing benzophenone-azines. 4,347,383, Cl. 564-249.000.

Itakura, Yoichi: *See*—
Goto, Takeshi; Kawakami, Noboru; Hirano, Itsuo; Itakura, Yoichi; and Kawahara, Yuji, 4,347,077, Cl. 75-0.50B.

Itel Corporation: *See*—
Morrison, Robert B.; Wade, James T.; and Zimmerman, Robert E., 4,346,790, Cl. 188-47.000.

Ito, Hiroko; Ohira, Eiji; and Ichikawa, Akira, to Nippon Telegraph and Telephone Public Corporation; and Hitachi, Ltd. Multi-frequency signal receiver. 4,347,408, Cl. 179-84.0VF.

Ito, Kenzo: *See*—
Akiyama, Susumu; Ito, Kenzo; Fukaya, Hiroyasu; Ogiso, Haruhiko; Hirabayashi, Yuji; and Kawamura, Takahide, 4,347,570, Cl. 364-431.040.

ITT Industries, Inc.: *See*—
Goertler, Horst; Hetzel, Friedrich; Knobloch, Uwe; Muller, Hans; Prohaska, Hans; Rachner, Horst; and Spieth, Wolfgang, 4,347,465, Cl. 318-266.000.

Ives, Milton N.: *See*—
Discenza, Frank J.; and Ives, Milton N., 4,347,411, Cl. 200-1.00B.

Iwai, Sakuya: *See*—
Kajikawa, Teruo; and Iwai, Sakuya, 4,347,275, Cl. 428-95.000.

Iwami, Isamu; Kimura, Shingo; and Iwasa, Toshio, to Asahi-Dow Limited. Foamable glass composition and glass foam. 4,347,326, Cl. 501-39.000.

Iwao, Jun-ichi; Oya, Masayuki; and Iso, Tadashi, to Santen Pharmaceutical Co., Ltd. Disulfide compounds. 4,347,371, Cl. 548-201.000.

Iwasa, Koji: *See*—
Ishihama, Satoshi; Miyoshi, Taisuke; and Iwasa, Koji, 4,346,964, Cl. 350-357.000.

Iwasa, Toshio: *See*—
Iwami, Isamu; Kimura, Shingo; and Iwasa, Toshio, 4,347,326, Cl. 501-39.000.

Iwata, Hidefumi; Tuchiya, Yoshimasa; and Iidaka, Toshiharu, to Kokusan Kinzoku Kogyo Kabushiki Kaisha; and Nissan Motor Co., Ltd. Hinge device for an openable automobile roof. 4,346,932, Cl. 296-216.000.

Iwata, Hiroo: *See*—
Handa, Hajime; Yonekawa, Yasuhiro; Yamagata, Sen; Taki, Waro; Ikada, Yoshito; and Iwata, Hiroo, 4,346,712, Cl. 128-325.000.

Iwaya, Shoichi: *See*—
Masujima, Sho; and Iwaya, Shoichi, 4,346,537, Cl. 51-413.000.

J. I. Case Company: *See*—
Schroeder, Philip W.; and Lindstrom, Edgar K., 4,346,617, Cl. 74-481.000.

Jacob, Jean-Baptiste; Mathieu, Yves; and Ruvoen, Michel, to Compagnie Industrielle des Telecommunications Cit-Alcatel. System for exchanging encoded messages between stations. 4,347,603, Cl. 370-85.000.

Jacobs, Ronald E., to Hoover Universal, Inc. Reclining actuator for a recliner chair. 4,346,933, Cl. 297-89.000.

Jacquet, Daniel, to Stanley Mabo S.A. Bubble tubes for spirit levels. 4,347,088, Cl. 156-69.000.

Jagodzinski, Peter F.; Field, Thomas R.; and Patrick, Carl D., to International Business Machines Corporation. Anti-reversal backcheck for printer ribbon cartridge takeup spool. 4,347,008, Cl. 400-208.000.

Jalichandra, Phijit; Dowell, John S.; and Carlson, John A., to Xerox Corporation. Printed circuit board projection imaging system. 4,346,987, Cl. 355-40.000.

Janssen, Alexander P. Visible indexes. 4,347,274, Cl. 428-78.000.

Janszen, Bryan L. Spin-jangle tambourine. 4,346,637, Cl. 84-418.000.

Japan Metals & Chemicals Co., Ltd.: *See*—
Nakamura, Yoshiyuki; Matsubara, Seiichi; Matsui, Takashi; Kumagai, Taiji; Senga, Taizo; and Fukutsu, Tsutomu, 4,347,614, Cl. 373-77.000.

Japan Servo Co.: *See*—
Sakamoto, Masafumi, 4,347,457, Cl. 310-256.000.

Japan Spectroscopic Co., Ltd.: *See*—
Ishii, Daido; and Konishi, Hideki, 4,346,610, Cl. 73-863.730.

Jasper, Louis J., Jr., to United States of America, Army. Travelling-wave tube utilizing vacuum housing as an rf circuit. 4,347,419, Cl. 219-10.55A.

Jatzek, Horst J.: *See*—
Beer, Douglas C.; and Jatzek, Horst J., 4,346,744, Cl. 144-176.000.
Weavell, Jack; and Jatzek, Horst J., 4,346,745, Cl. 144-176.000.

Jefferis, Raymond P., III: *See*—
Duttera, James; Jefferis, Raymond P., III; Matteson, David; and Szentiaszloi, Alexander, 4,347,127, Cl. 209-164.000.

Jenkins, Jon A.: *See*—
Cannon, Raymond E.; Jenkins, Jon A.; and Wilson, Larry L., 4,346,606, Cl. 73-861.410.

Jenkins, Kenneth L., to Manville Service Corporation. Energy efficient perlite expansion process. 4,347,155, Cl. 252-378.00P.

Jensen, William: *See*—
Lau, Charles R.; Jensen, William; and Allen, Perrin A., 4,347,280, Cl. 428-304.400.

Jeromin, Lothar S.; Geddes, Glenn F.; Baumann, Otto S.; and Santoro, Joseph F., to Xerox Corporation. Xeroradiographic intraoral dental system. 4,346,983, Cl. 355-3.00R.

Jim Walter Resources, Inc.: *See*—
White, Claude C.; and Carr, Frederick, 4,347,020, Cl. 405-260.000.

John, David I.: *See*—
Giddings, Peter J.; John, David I.; and Thomas, Eric J., 4,347,182, Cl. 260-245.20R.

John Zink Company: *See*—
Reed, Robert D.; Martin, Richard R.; and Goodnight, Hershel E., 4,347,052, Cl. 431-188.000.

Johnson, Bruce K.; and Whiteside, George D., to Polaroid Corporation. Photographic apparatus with controlled shutter blade time out. 4,346,971, Cl. 354-34.000.

Johnson, Fred D.; and Tzakis, George J., to Zenith Radio Corporation. G2 Set-up circuit for a television receiver. 4,347,528, Cl. 358-10.000.

Johnson, George A.: *See*—
Hooper, David C.; Johnson, George A.; Peter, Donald; and Rennie, George K., 4,347,153, Cl. 252-174.250.

Johnson, Jerome B.; and Cox, Gordon F. N., to Global Marine Inc. Stress sensor particularly suitable for elastic, plastic and visco-elastic materials. 4,346,600, Cl. 73-768.000.

Johnson Pet-Dor, Inc.: *See—*
Holmes, David L.; and Hollander, Anne M., 4,347,502, Cl. 340-545.000.

Johnson, Richard A.; and Lloyd, Norman E., to Nabisco Brands, Inc. Chromatographic process for enzyme purification. 4,347,322, Cl. 435-179.000.

Johnston Construction Limited: *See—*
Wrightson, Noel T.; and Currie, Russell D., 4,347,018, Cl. 405-150.000.

Johnston, David B. R.: *See—*
Christensen, Burton G.; Johnston, David B. R.; and Schmitt, Susan M., 4,347,367, Cl. 546-272.000.
Christensen, Burton G.; Johnston, David B. R.; and Schmitt, Susan M., 4,347,368, Cl. 546-272.000.

Johnston Pipes Limited: *See—*
Wrightson, Noel T.; and Currie, Russell D., 4,347,018, Cl. 405-150.000.

Jones, Donald E.; Parker, DeRay; and Boren, Paul R., to United States of America, Energy. Method for preparing dosimeter for measuring skin dose. 4,346,511, Cl. 29-458.000.

Jones, Frank W., to Alco Foodservice Equipment Company. Chopping and shredding device. 4,346,634, Cl. 83-431.000.

Jones, John C.; Sifford, Perry P.; and Sutton, Joel F., to United Technologies Corporation. Blade to blade vibration damper. 4,347,040, Cl. 416-190.000.

Joseph, Joseph P.; Dusza, John P.; and Bernstein, Seymour, to American Cyanamid Company. Novel 3-substituted amino-1-substituted heteroaryl-2-pyrazolines. 4,347,251, Cl. 424-263.000.

Jouaillec, Joseph, to Societe Nationale Industrielle Aerospatiale. Process and device for installing a vertical gyroscope. 4,346,614, Cl. 74-5.120.

Joyce, Edward R.; and Smith, William L., to SCM Corporation. Method for tall oil recovery and apparatus therefor. 4,347,110, Cl. 204-149.000.

Juhas, Joseph A.: *See—*
Dodd, Malcolm J.; and Juhas, Joseph A., 4,346,756, Cl. 165-48.00R.

Juichiro Ozawa: *See—*
Hayashi, Yoshihiro, 4,347,139, Cl. 210-654.000.

Jumberca, S.A.: *See—*
Guell, Jose M. D., 4,346,572, Cl. 66-93.000.

Kaan, Joseph P.: *See—*
Wojtecki, Rudolph G.; and Kaan, Joseph P., 4,347,433, Cl. 219-535.000.

Kabushiki Kaisha Daini Seikosha: *See—*
Ishihama, Satoshi; Miyoshi, Taisuke; and Iwasa, Koji, 4,346,964, Cl. 350-357.000.
Nishizawa, Junichi; and Shimbo, Masafumi, 4,346,513, Cl. 29-580.000.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Ando, Hiroyuki, 4,346,581, Cl. 72-347.000.
Sakamoto, Masaaki; and Takeuchi, Shinji, 4,346,618, Cl. 74-491.000.
Tatsuo, Masahiro, 4,346,623, Cl. 74-764.000.
Ueno, Kunimitsu, 4,346,796, Cl. 192-18.00A.

Kabushiki Kaisha Yakult Honsha: *See—*
Mutai, Masahiko; Yokokura, Teruo; Kobayashi, Seizaburo; and Kato, Ikuo, 4,347,240, Cl. 424-92.000.

Kaibara, Nobuhiro; and Takaichi, Kazuyoshi, to Diesel Kiki Co., Ltd. Injection timing control system for fuel injection pump. 4,346,688, Cl. 123-502.000.

Kaiser, Paul H.: *See—*
Giguere, Edward L.; Kaiser, Paul H.; Campbell, Gordon M.; Hoffman, Peter F.; and Boutchyard, Hansford, Jr., 4,347,568, Cl. 364-300.000.

Kaiser, Roman; and Lamparsky, Dietmar, to Givaudan Corporation. 2-Methyl-2-vinyl-5-(1'-hydroxy or acyloxy-1',5'-dimethyl-hex-4'-en-1'-yl)tetrahydrofuran. 4,347,190, Cl. 549-497.000.

Kajikawa, Teruo; and Iwai, Sakuya, to Nippon Petrochemical Company. Carpet tile and method of making same. 4,347,275, Cl. 428-95.000.

Kajitani, Ikuo: *See—*
Noritake, Yutaka; Kajitani, Ikuo; Arai, Sakuji; and Muto, Toshiaki, 4,347,219, Cl. 422-180.000.

Kali Chemie AG: *See—*
Wolstein, Friedrich; and Koch, Gerhard, 4,347,228, Cl. 423-321.00R.

Kalina, Alexander I. Generation of energy by means of a working fluid, and regeneration of a working fluid. 4,346,561, Cl. 60-673.000.

Kalinsky, Wayne A., to Rockwell International Corporation. Voltage balance control for split capacitors in half bridge DC to DC converter. 4,347,558, Cl. 363-17.000.

Kaloi, Cyril M., to United States of America, Navy. Microstrip backfire antenna. 4,347,517, Cl. 343-700.0MS.

Kamehara, Nobuo: *See—*
Yokouchi, Kishio; Ogawa, Hiromi; Yokoyama, Hiromitsu; Kamehara, Nobuo; Niwa, Koichi; and Murakawa, Kyohei, 4,346,516, Cl. 29-845.000.

Kaminstein, Bernard. Leather grip. 4,346,890, Cl. 273-73.00J.

Kamuro, Takashi: *See—*
Ohtsuga, Hisao; Uzawa, Koji; Kamuro, Takashi; Sudo, Susumu; Hirose, Tomoyoshi; Miyao, Masafumi; and Koga, Motoyuki, 4,346,922, Cl. 285-109.000.

Kanai, Hiroshi: *See—*
Wakita, Nobuaki; and Kanai, Hiroshi, 4,346,686, Cl. 123-339.000.

Kanazashi, Tetuo: *See—*
Saito, Masaki; and Kanazashi, Tetuo, 4,347,604, Cl. 370-85.000.

Kandler, Joachim: *See—*
Staendeke, Horst; Dany, Franz-Josef; and Kandler, Joachim, 4,347,334, Cl. 524-416.000.

Kaneda, Saburo; Tsuchimoto, Takamitsu; Shimizu, Kazuyuki; and Ikegami, Fujio, to Fujitsu Limited. Address control system for software simulation. 4,347,565, Cl. 364-200.000.

Kango Electric Hammers Limited: *See—*
Vaughan, Christopher A., 4,346,767, Cl. 173-109.000.

Kaplon, David A.: *See—*
Bright, Edward J.; Kaplon, David A.; and Scheingold, William S., 4,346,952, Cl. 339-17.0CF.

Kapp, Wolfgang, to Degesch GmbH. Delayed release coated metal phosphide pesticides. 4,347,241, Cl. 424-128.000.

Karcher, DeWayne E., to Honeywell Information Systems Inc. Material handling apparatus. 4,346,817, Cl. 221-312.00R.

Karg, Walter E. Adjustable spatula. 4,346,927, Cl. 294-7.000.

Kassai Kabushiki Kaisha: *See—*
Kassai, Kenzou, 4,346,908, Cl. 280-87.02R.

Kassai, Kenzou, to Kassai Kabushiki Kaisha. Vehicle for children. 4,346,908, Cl. 280-87.02R.

Kastovich, John C.: *See—*
Meyerhoff, Alfred; Kastovich, John C.; Richard, James A.; and Vales, Richard J., 4,346,845, Cl. 239-418.000.

Kataoka, Minoru: *See—*
Fukuyama, Hiroomi; Isobe, Shinichi; Yonekura, Mikio; and Kataoka, Minoru, 4,347,609, Cl. 371-34.000.

Kato, Akihiko: *See—*
Osumi, Yasuaki; Suzuki, Hiroshi; Kato, Akihiko; and Nakane, Masanori, 4,347,082, Cl. 75-171.000.

Kato, Ikuo: *See—*
Mutai, Masahiko; Yokokura, Teruo; Kobayashi, Seizaburo; and Kato, Ikuo, 4,347,240, Cl. 424-92.000.

Kato, Kohji: *See—*
Takano, Hirotaka; Takahashi, Hideyuki; Hirogohri, Ryoichi; and Kato, Kohji, 4,347,396, Cl. 585-441.000.

Kato, Shinichi: *See—*
Murofushi, Satoru; Shibuya, Tadao; Kato, Shinichi; and Endo, Mitsuo, 4,347,504, Cl. 340-638.000.

Kato, Toshiro: *See—*
Kirino, Osamu; Kato, Toshiro; and Yamamoto, Shigeo, 4,347,188, Cl. 549-436.000.

Kato, Tsumugu: *See—*
Nagaoka, Kinnosuke; Kato, Tsumugu; and Nozawa, Mitsuru, 4,347,072, Cl. 65-27.000.

Katoh Electrical Machinery Co., Ltd.: *See—*
Hioki, Shunkichi, 4,347,597, Cl. 369-231.000.

Katsube, Hideo; Gamo, Gotaro; Nomura, Yoshiyuki; and Okuda, Kanemasa, to Fujitsu Fanuc Limited. Electric discharge machine. 4,347,423, Cl. 219-69.00W.

Katsube, Junki; Shimomura, Hiromi; Inokuma, Shun; and Sugie, Akihiko, to Sumitomo Chemical Company, Limited. Tricyclic cage compounds, their synthesis and use as antiviral agents. 4,347,254, Cl. 424-275.000.

Katsuma, Makoto; Suzuki, Masayuki; Shinbori, Kenichi; and Murakami, Hiroyasu, to Canon Kabushiki Kaisha. Focusing screen interchanging device in single lens reflex camera. 4,346,973, Cl. 354-152.000.

Katsuno, Yasumitsu: *See—*
Kawasaki, Kazuyoshi; and Katsuno, Yasumitsu, 4,347,216, Cl. 422-78.000.

Katz, Jerome; and Fogel, Sidney J. Method and apparatus for production of honey. 4,346,490, Cl. 6-1.000.

Kauffman, Ivan L.; and Dwyer, Gregory J., to Ex-Cell-O Corporation. Carton filler and volume adjuster apparatus for packaging machines. 4,346,819, Cl. 222-41.000.

Kaufmann, Kenneth M., to Pako Corporation. Dual rate automatic anti-oxidation replenisher control. 4,346,981, Cl. 354-324.000.

Kaus, Malcolm J.; and Miro, Nemesio D., to Dart Industries, Inc. Supported high efficiency polyolefin catalyst component and methods of making and using the same. 4,347,158, Cl. 252-429.00B.

Kavouras, Stephen P.; Post, Paul C.; Wells, Roderick A.; and Rutkowski, Stephen L., to Kavouras, Stephen P. Apparatus for processing weather radar information. 4,347,618, Cl. 375-37.000.

Kawabata, Minoru; Honaga, Susumu; and Inaguma, Yoshiharu, to Toyoda Koki Kabushiki Kaisha. Hydraulic pump for power steering. 4,347,048, Cl. 417-310.000.

Kawabata, Takashi; Tsunekawa, Tokuichi; Hosoe, Kazuya; Kinoshita, Takao; Sakai, Shinji; and Taguchi, Tatsuya, to Canon Kabushiki Kaisha. Focus detecting device. 4,346,970, Cl. 354-25.000.

Kawabata, Yuichi: *See—*
Fukushima, Toshitaka; Koyama, Kazumi; Ueno, Kouji; Kawabata, Yuichi; and Miyamura, Tamio, 4,347,584, Cl. 365-104.000.

Kawachi, Yasunori: *See—*
Mimura, Koji; Kawachi, Yasunori; and Kawai, Atsushi, 4,347,203, Cl. 264-41.000.

Kawada, Ken; and Harada, Kazumasa, to Fuji Photo Film Co., Ltd. Web winding device. 4,346,852, Cl. 242-56.200.

Kawaguchi, Hisao: *See—*
Inohara, Akio; Sawae, Kiyoshi; Kawaguchi, Hisao; and Fujimoto, Takeo, 4,347,074, Cl. 65-32.000.

Kawahara, Yuji: *See*—
Goto, Takeshi; Kawakami, Noboru; Hirano, Itsuo; Itakura, Yoichi; and Kawahara, Yuji, 4,347,077, Cl. 75-0.50B.

Kawai, Atsushi: *See*—
Mimura, Koji; Kawachi, Yasunori; and Kawai, Atsushi, 4,347,203, Cl. 264-41.000.

Kawai, Kiyoshi: *See*—
Yamada, Yasuharu; and Kawai, Kiyoshi, 4,347,157, Cl. 252-429.00B.

Kawakami, Noboru: *See*—
Goto, Takeshi; Kawakami, Noboru; Hirano, Itsuo; Itakura, Yoichi; and Kawahara, Yuji, 4,347,077, Cl. 75-0.50B.

Kawamoto, Mutsumi, to Aisin-Warner K.K. Control device for automatic transmission. 4,346,626, Cl. 74-866.000.

Kawamoto, Mutsumi; and Miki, Nobuaki, to Aisin-Warner K.K. Shift control device for an automatic transmission. 4,346,627, Cl. 74-869.000.

Kawamura, Takahide: *See*—
Akiyama, Susumu; Ito, Kenzo; Fukaya, Hiroyasu; Ogiso, Haruhiko; Hirabayashi, Yuji; and Kawamura, Takahide, 4,347,570, Cl. 364-431.040.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Fujikawa, Tetsuzo, 4,346,685, Cl. 123-193.00P.

Kawasaki, Kazuyoshi; and Katsuno, Yasumitsu, to Mitsubishi Kasei Kogyo Kabushiki Kaisha. Wet sample decomposing apparatus. 4,347,216, Cl. 422-78.000.

Kawasaki, Teruo, to Nissan Motor Co., Ltd. Control device for an automotive vehicle FM radio. 4,347,404, Cl. 179-1.0GB.

Kayama, Yasutaka: *See*—
Hara, Takeshi; and Kayama, Yasutaka, 4,347,369, Cl. 548-149.000.

Keep, Geoffrey S., to Wiggins Teape Group Limited, The. Method of and apparatus for applying a coating to a web of sheet material. 4,347,269, Cl. 427-428.000.

Keeton, John H. Transferring liquid onto a roller surface. 4,346,531, Cl. 47-1.500.

Kehrer, Wolfgang; and Lachmann, Helmut, to Borsig GmbH. Heat exchanger for cooling slag-containing gases from coal gasification. 4,346,758, Cl. 165-134.00R.

Keil, John G.: *See*—
Cron, Martin J.; Keil, John G.; Lin, Jeng S.; Ruggeri, Mariano; and Walker, Derek, 4,347,354, Cl. 536-10.000.

Keller, Dorothy V. Tranquilizing bed. 4,346,486, Cl. 5-447.000.

Keller, Louis D. Advertising display for pick-up trucks or similar vehicles. 4,346,529, Cl. 40-588.000.

Kelsey, Thomas: *See*—
Headley, Peter; Kelsey, Thomas; and Murdy, John, 4,347,414, Cl. 200-144.00R.

Kemeny, George A.; and Litz, Donald C., to Westinghouse Electric Corp. Electromagnetic projectile launcher with self-augmenting rails. 4,347,463, Cl. 318-135.000.

Kenjo, Hideki: *See*—
Ohkada, Shinzo; and Kenjo, Hideki, 4,347,198, Cl. 264-2.300.

Kenma, Shigeyuki, to Hitachi, Ltd. Carburetor equipped with an auto-choke device. 4,347,196, Cl. 261-39.00B.

Kennametal Inc.: *See*—
College, Michael A.; and McKenry, Robert J., 4,346,934, Cl. 299-92.000.

Kennedy, Warren C.: *See*—
Scarton, Henry A.; Kennedy, Warren C.; Gaylo, Keith R.; and Caplan, Clark R., 4,346,783, Cl. 181-230.000.

Kensinger, Robert A.; and Norman, Robert N., to Honeywell Inc. Load management control apparatus with improved duty cycle operation. 4,347,576, Cl. 364-493.000.

Keshavan, Hampapur R.: *See*—
Abbott, Ned E.; Keshavan, Hampapur R.; and McGuire, Robert J., 4,347,600, Cl. 370-13.000.

Kesten, Arthur S.; and Haught, Alan F., to United Technologies Corporation. Self-driven chemical heat pipe. 4,346,752, Cl. 165-1.000.

Kienzle, Wolfgang; Paschke, Werner; and Nagele, Erwin, to Robert Bosch GmbH. Flow rate meter. 4,346,589, Cl. 73-118.000.

Kieser, Manfred: *See*—
Gehlhaus, Jurgen; and Kieser, Manfred, 4,347,111, Cl. 204-159.160.

Kikuchi, Masatsugu; and Tamai, Masayoshi, to Fuji Xerox Co., Ltd. Ink jet printer. 4,347,519, Cl. 346-75.000.

Kilbourn, Frederick A.: *See*—
Reed, Stewart D.; Sills, Arthur A.; Kraft, John H.; Houle, Raymond T.; Redwine, Michael A.; and Kilbourn, Frederick A., 4,346,485, Cl. 4-555.000.

Kimberly-Clark Corporation: *See*—
Hlaban, James J.; Grube, Herbert E.; and Woon, Paul S., 4,347,092, Cl. 156-227.000.

Kimura, Hiroyuki; Tamura, Shuichi; and Yokota, Hideo, to Canon Kabushiki Kaisha. Distance measuring device. 4,346,988, Cl. 356-1.000.

Kimura, Katsuhiro: *See*—
Hirota, Yukitsugu; Endo, Akira; Kimura, Katsuhiro; Morozumi, Hiroshi; and Sekine, Kenji, 4,346,774, Cl. 180-167.000.

Kimura, Kenji, to Olympus Optical Co., Ltd. Auto-tracking system for magnetic tape recording device. 4,347,534, Cl. 360-77.000.

Kimura, Shingo: *See*—
Iwami, Isamu; Kimura, Shingo; and Iwasa, Toshio, 4,347,326, Cl. 501-39.000.

Kimura, Shinji; Takao, Hiroshi; Ambe, Satoshi; and Akimune, Yoshio, to Nissan Motor Co., Ltd. Flat thin film type oxygen sensor. 4,347,114, Cl. 204-195.00S.

Kimura, Takeo: *See*—
Shiga, Tetsuo; Ozaki, Masaru; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, 4,347,310, Cl. 430-620.000.

Kingsley, William, to Xerox Corporation. Document scanner. 4,346,984, Cl. 355-8.000.

Kingston, John C. Wheelchair loading device for trains. 4,347,030, Cl. 414-556.000.

Kinoshita, Takao: *See*—
Kawabata, Takashi; Tsunekawa, Tokuichi; Hosoe, Kazuya; Kinoshita, Takao; Sakai, Shinji; and Taguchi, Tatsuya, 4,346,970, Cl. 354-25.000.

Kinzbach, Robert B., to Weatherford/Lamb, Inc. Tong assembly. 4,346,629, Cl. 81-57.200.

Kirchbrucher, Rudiger: *See*—
Elsner, Burckhardt; and Kirchbrucher, Rudiger, 4,347,021, Cl. 405-293.000.

Kirino, Osamu; Kato, Toshiro; and Yamamoto, Shigeo, to Sumitomo Chemical Company, Limited. N-Benzoylanthranilate derivatives. 4,347,188, Cl. 549-436.000.

Kister, Horst; and Ullrich, Horst, to VDO Adolf Schindling AG. Circuit arrangement for time division multiplex data transmission with a bus system. 4,347,602, Cl. 370-85.000.

Kitahara, Nobuko: *See*—
Ishihara, Shunichi; Kitajima, Nobuo; Nishigaki, Yuji; and Kitahara, Nobuko, 4,347,296, Cl. 430-42.000.
Ishihara, Shunichi; Kitajima, Nobuo; Nishigaki, Yuji; and Kitahara, Nobuko, 4,347,297, Cl. 430-42.000.

Kitajima, Nobuo: *See*—
Ishihara, Shunichi; Kitajima, Nobuo; Nishigaki, Yuji; and Kitahara, Nobuko, 4,347,296, Cl. 430-42.000.
Ishihara, Shunichi; Kitajima, Nobuo; Nishigaki, Yuji; and Kitahara, Nobuko, 4,347,297, Cl. 430-42.000.

Kitaoka, Yoji; Hirato, Mizuho; and Miyatani, Kazuo, to Agency of Industrial Science and Technology. Apparatus for making supply of high pressure liquid and relief of pressure of the same. 4,347,223, Cl. 422-242.000.

Kitazawa, Akira: *See*—
Hashizume, Masao; and Kitazawa, Akira, 4,347,605, Cl. 370-88.000.

Kitchen, Garry E.; Kitchen, Steven G.; and Wickstead, James C. Electronic pool game. 4,346,892, Cl. 273-85.00G.

Kitchen, Steven G.: *See*—
Kitchen, Garry E.; Kitchen, Steven G.; and Wickstead, James C., 4,346,892, Cl. 273-85.00G.

Kitzmiller, George. Solar heat exchanger. 4,346,695, Cl. 126-444.000.

Kizlyk, Mervin P.: *See*—
Friesen, Henry; and Kizlyk, Mervin P., 4,347,031, Cl. 414-686.000.

KLA Instruments Corporation: *See*—
Levy, Kenneth; and Sandland, Paul, 4,347,001, Cl. 356-398.000.

Klank, Otto, to Licentia Patent-Verwaltungs-GmbH. Method and apparatus for the measurement and indication of the position of a coiled material in tape form. 4,347,538, Cl. 360-137.000.

Klebe, Hans: *See*—
Schmid, Josef; Lange, Ludwig; Klebe, Hans; and Schutte, Dieter, 4,347,229, Cl. 423-336.000.

Klein, Hans J.: *See*—
Pohler, Friedmar; Falk, Hans; Muller, Josef; Klein, Hans J.; and Hoffacker, Franz, 4,346,668, Cl. 118-665.000.

Kletch, Stanley J., to Bricmont & Associates, Inc. Regenerator checker-work brick. 4,346,753, Cl. 165-9.100.

Kliem, Peter O., to Polaroid Corporation. Novel diffusion transfer film units. 4,347,301, Cl. 430-215.000.

Kline, Larry Harold: *See*—
Beck, Milton A., 4,346,910, Cl. 280-432.000.

Kling-Tecs, Inc.: *See*—
Roberts, John S., 4,347,206, Cl. 264-176.00F.
Roberts, John S., 4,347,207, Cl. 264-176.00F.

Klockner-Humboldt-Deutz AG: *See*—
Moser, Gottfried, 4,346,839, Cl. 237-12.30R.

Klockner-Werke AG: *See*—
Heiermann, Siegfried, 4,346,903, Cl. 277-58.000.

Kluwe, Paul P.: *See*—
White, Dale A.; Kluwe, Paul P.; and Greenwood, Leon D., 4,347,442, Cl. 290-48.000.

Kneissl, Richard, to Nova-Handels AG. Closure for bottles. 4,346,810, Cl. 215-237.000.

Knobloch, Uwe: *See*—
Goertler, Horst; Hetzel, Friedrich; Knobloch, Uwe; Muller, Hans; Prohaska, Hans; Rachner, Horst; and Spieth, Wolfgang, 4,347,465, Cl. 318-266.000.

Knoll, Gunter: *See*—
Fischer, Hermann; Friese, Karl-Hermann; Gruber, Hans-Ulrich; Heinemann, Wolfgang; Knoll, Gunter; Linder, Ernst; Maurer, Helmut; Noack, Rainer; Steinke, Leo; Weber, Lothar; and Weyl, Helmut, 4,347,113, Cl. 204-195.00S.

Knott, Jack E., II, to American Can Company. Ethylene-vinyl alcohol with phenol additive. 4,347,337, Cl. 525-60.000.

Knott, Jack E., II: *See*—
Odorzynski, Thomas W.; and Knott, Jack E., II, 4,347,332, Cl. 524-169.000.

Knowles, Richard P., to Lucas Industries Limited. Starting aids for internal combustion engines. 4,346,679, Cl. 123-145.00A.

Knudsen, Niels; Orpana, Veikko; Wisur, Matti; Warulf, Olov; Bergqvist, Hakan; and Afzelius, Raoul, to SPACAB AB. Gas-filled cable with composite conduit of low carbon steel and aluminum and having particle traps. 4,347,401, Cl. 174-14.00R.

Kobale, Manfred; and Krueger, Hans, to Siemens Aktiengesellschaft. Liquid crystal display device. 4,346,963, Cl. 350-344.000.
Kobayashi, Hidehiko: *See—*
Shiga, Tetsuo; Ozaki, Masaru; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, 4,347,310, Cl. 430-620.000.
Kobayashi, Itaru. Apparatus for automatically turning the pages of a music box. 4,346,641, Cl. 84-487.000.
Kobayashi, Seizaburo: *See—*
Mutai, Masahiko; Yokokura, Teruo; Kobayashi, Seizaburo; and Kato, Ikuo, 4,347,240, Cl. 424-92.000.
Koch, Gerhard: *See—*
Wolstein, Friedrich; and Koch, Gerhard, 4,347,228, Cl. 423-321.00R.
Koch, Wilhelm: *See—*
Merkenich, Karl; Koch, Wilhelm; Glandorf, Kaete; Uhlmann, Gerd; and Scheurer, Guenther, 4,347,258, Cl. 426-334.000.
Koda, Akira; Sato, Fumitaka; and Nishibe, Shinji, to Tokyo Shibaura Denki Kabushiki Kaisha. Data processor with register file and arithmetic logic circuit on one chip and register means directly connected to the chip. 4,347,566, Cl. 364-200.000.
Koga, Motoyuki: *See—*
Ohtsuga, Hisao; Uzawa, Koji; Kamuro, Takashi; Sudo, Susumu; Hirose, Tomoyoshi; Miyao, Masafumi; and Koga, Motoyuki, 4,346,922, Cl. 285-109.000.
Kohno, Teruo: *See—*
Shibahara, Takashi; Kohno, Teruo; and Misaka, Yoshisuke, 4,346,575, Cl. 72-16.000.
Kohzai, Yoshinori; Fujioka, Yoshiki; and Ota, Naoto, to Fujitsu Fanuc Limited. Spindle orientation control apparatus. 4,347,470, Cl. 318-602.000.
Kohzai, Yoshinori; Fujioka, Yoshiki; and Ota, Naoto, to Fujitsu Fanuc Limited. Machine tool drive motor control system. 4,347,471, Cl. 318-616.000.
Kohzaki, Toshiaki: *See—*
Isshiki, Tomiya; Tomita, Tetsuo; Sakaguchi, Shuzabu; Kohzaki, Toshiaki; Aoki, Osamu; Takeda, Norio; and Aoki, Yoshiyuki, 4,347,383, Cl. 564-249.000.
Kojima, Ichiro; Maruhashi, Kenji; and Fujiwara, Yasuo, to Nippon Oil Company, Ltd. Process for separating and recovering coproporphyrin and uroporphyrin from a culture broth containing them. 4,347,184, Cl. 260-314.000.
Kokusan Kinzoku Kogyo Kabushiki Kaisha: *See—*
Iwata, Hidefumi; Tuchiya, Yoshimasa; and Iidaka, Toshiharu, 4,346,932, Cl. 296-216.000.
Kollmyer, Robert E.: *See—*
Caras, Bernard; and Kollmyer, Robert E., 4,346,951, Cl. 316-19.000.
Kollonitsch, Janos; Perkins, Leroy M.; Doldouras, George A.; and Marburg, Stephen, to Merck & Co., Inc. Acid addition salts of N-trityl-α-fluoromethylhistidine enantiomer derivatives. 4,347,374, Cl. 548-344.000.
Komoto, Shinsuke; and Sekiguchi, Tetsuo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Zoom lens barrel for macrophotographing. 4,346,967, Cl. 350-430.000.
Kondow, Ryotaro: *See—*
Yamaura, Mitsuru; Kondow, Ryotaro; Mitani, Megumu; and Nii, Yoshiji, 4,347,581, Cl. 364-900.000.
Konishi, Hideki: *See—*
Ishii, Daido; and Konishi, Hideki, 4,346,610, Cl. 73-863.730.
Konishi, Masaki: *See—*
Fukuda, Tadaji; Sugata, Masao; Nakagiri, Takashi; and Konishi, Masaki, 4,347,436, Cl. 250-211.00R.
Kono, Tomio: *See—*
Yanagida, Minoru; and Kono, Tomio, 4,347,080, Cl. 75-124.000.
Kontrovitz, Harold S.: *See—*
Moore, Robert A.; Norlund, Bruce K.; Kontrovitz, Harold S.; Robbins, Clayton B.; and Brooks, Jeffrey B., 4,347,525, Cl. 346-153.100.
Korf Technologies, Inc.: *See—*
Wells, William, 4,347,079, Cl. 75-52.000.
Korver, Jan A. C., to U.S. Philips Corporation. Picture display device arranged for displaying a mixed picture signal as an interlaced television picture. 4,347,532, Cl. 358-183.000.
Kosner, Jerry J., Jr.: *See—*
Guenther, Kenneth L.; Kosner, Jerry J., Jr.; Erikson, Rolf B.; and Zemke, Edward H., 4,346,876, Cl. 271-11.000.
Kottas, Charles E.: *See—*
Kottas, Milo; Kottas, Mary E.; Kottas, Robert P.; Kottas, Charles E.; and Kottas, Joseph W., 4,346,976, Cl. 354-196.000.
Kottas, Joseph W.: *See—*
Kottas, Milo; Kottas, Mary E.; Kottas, Robert P.; Kottas, Charles E.; and Kottas, Joseph W., 4,346,976, Cl. 354-196.000.
Kottas, Mary E.: *See—*
Kottas, Milo; Kottas, Mary E.; Kottas, Robert P.; Kottas, Charles E.; and Kottas, Joseph W., 4,346,976, Cl. 354-196.000.
Kottas, Milo; Kottas, Mary E.; Kottas, Robert P.; Kottas, Charles E.; and Kottas, Joseph W. Device for automatic reciprocation of lens angle and aperture of surveillance camera. 4,346,976, Cl. 354-196.000.
Kottas, Robert P.: *See—*
Kottas, Milo; Kottas, Mary E.; Kottas, Robert P.; Kottas, Charles E.; and Kottas, Joseph W., 4,346,976, Cl. 354-196.000.
Kovacs, Julius. Adjustable socket wrench. 4,346,632, Cl. 81-174.000.
Kovalick, Albert, to Hewlett-Packard Company. Hand held data bus analyzer. 4,347,434, Cl. 235-92.0SH.
Koyama, Kazumi: *See—*
Fukushima, Toshitaka; Koyama, Kazumi; Ueno, Kouji; Kawabata, Yuichi; and Miyamura, Tamio, 4,347,584, Cl. 365-104.000.
Koyama, Kenji: *See—*
Ohno, Shotaro; Koyama, Kenji; and Fukuda, Mitsutoshi, 4,347,138, Cl. 210-639.000.
Kraft, John H.: *See—*
Reed, Stewart D.; Sills, Arthur A.; Kraft, John H.; Houle, Raymond T.; Redwine, Michael A.; and Kilbourn, Frederick A., 4,346,485, Cl. 4-555.000.
Krasij, Bohdan: *See—*
Mune, Charles; and Krasij, Bohdan, 4,347,488, Cl. 335-9.000.
Krasnicki, Edward J.: *See—*
Lewis, Armand F.; Ma, Chen-Chi M.; Quach, Hoa; and Krasnicki, Edward J., 4,347,287, Cl. 428-378.000.
Krasser, Fritz, to Ellenberger & Poensgen GmbH. Bimetal-controlled overload protection switch. 4,347,494, Cl. 337-66.000.
Kraus, Hans-Joachim; and Walter, Berthold, to Dentaurum H.P. Winkelstroeter KG. Orthodontic expansion screw. 4,347,054, Cl. 433-7.000.
Kraus, Roger B.; and Pretti, Rudy, to Rethread, Inc. Thread repair tool. 4,346,491, Cl. 10-111.000.
Krause, Gerhard: *See—*
Zeitrager, Gunther; Krause, Gerhard; and Guthmann, Herbert, 4,346,863, Cl. 248-75.000.
Krause, Rolf, to Gerb. Eickhoff Machinenfabrik und Eisengiesserei m.b.H. Cowl assembly for longwall mining machine. 4,346,939, Cl. 299-45.000.
Krauss, Ferdinand A.; Ganyard, Ivan S.; and Sabbatis, Raymond E., to Loopco Industries, Inc. Slitter with removable head. 4,346,635, Cl. 83-479.000.
Krauss, Rudolf: *See—*
Peters, Klaus-Jurgen; Krauss, Rudolf; and Binggeser, Ernst, 4,346,577, Cl. 72-129.000.
Krenitsky, Thomas A.; and Rideout, Janet L., to Burroughs Wellcome Co. Synthesis of ribosides using bacterial phosphorylase. 4,347,315, Cl. 435-87.000.
Kristiansen, Svend H., to Nordisk Ventilator Co., A/S. Thrust bearing device, particularly for taking up oscillating rotational movements. 4,346,948, Cl. 308-219.000.
Kristinsson, Haukur: *See—*
Lukaszczyk, Alfons; Martin, Henry; Diel, Peter J.; Fory, Werner; Gatzi, Karl; Kristinsson, Haukur; Muller, Beat; Muntwyler, Rene; Pachlatko, Johannes P.; Rempfler, Hermann; Schurter, Rolf; and Szczepanski, Henry, 4,347,372, Cl. 548-217.000.
Kroll, Arthur S.; and Shuster, Frank A., to Eastman Kodak Company. Electrographic development apparatus and method for use with partially-conductive developer. 4,347,298, Cl. 430-97.000.
Kroy, Walter: *See—*
Hofmann, Otto; Kroy, Walter; and Nave, Peter, 4,347,511, Cl. 343-5.0PC.
Krueger, Hans: *See—*
Kobale, Manfred; and Krueger, Hans, 4,346,963, Cl. 350-344.000.
Kruer, Melvin R.: *See—*
Esterowitz, Leon; Allen, Roger E.; Kruer, Melvin R.; and Bartoli, Filbert J., 4,347,485, Cl. 372-42.000.
Kruger, Gary A.: *See—*
Rice, Hal H.; and Kruger, Gary A., 4,346,556, Cl. 60-272.000.
Krutsch, John R.: *See—*
Barlow, Gordon A.; and Krutsch, John R., 4,346,889, Cl. 273-1.0GA.
Kubalak, Thomas P.; Berghoff, Gene M.; and Palmer, William J. Electronic fuel management system. 4,347,496, Cl. 340-52.00R.
Kubota, Yukio. Slip joint of endotracheal tube. 4,346,702, Cl. 128-207.140.
Kuge, Tsukasa; Tamura, Yasuyuki; and Tanigawa, Koichi, to Canon Kabushiki Kaisha. Image formation method and apparatus. 4,346,986, Cl. 355-14.0CH.
Kulle, Lee K., to Baxter Travenol Laboratories, Inc. Sleeve valve for parenteral solution device. 4,346,704, Cl. 128-214.00R.
Kumagai, Taiji: *See—*
Nakamura, Yoshiyuki; Matsubara, Seiichi; Matsui, Takashi; Kumagai, Taiji; Senga, Taizo; and Fukutsu, Tsutomu, 4,347,614, Cl. 373-77.000.
Kuniya, Keiichi: *See—*
Watanabe, Ryuji; and Kuniya, Keiichi, 4,347,413, Cl. 200-144.00B.
Kurahashi, Osamu: *See—*
Miwa, Kiyoshi; Tsuchida, Takayasu; Kurahashi, Osamu; Nakamori, Shigeru; Sano, Konosuke; and Momose, Haruo, 4,347,318, Cl. 435-115.000.
Kuramoto, Naoyuki: *See—*
Nakamura, Toshiaki; and Kuramoto, Naoyuki, 4,346,570, Cl. 464-120.000.
Kuraray Company, Ltd.: *See—*
Handa, Hajime; Yonekawa, Yasuhiro; Yamagata, Sen; Taki, Waro; Ikada, Yoshito; and Iwata, Hiroo, 4,346,712, Cl. 128-325.000.
Nagase, Yoshinori; Shibatani, Kyoichiro; Yamauchi, Junichi; and Omura, Ikuo, 4,347,174, Cl. 523-116.000.
Yamauchi, Junichi; Shibatani, Kyoichiro; Ikeguchi, Eiji; Omura, Ikuo; and Nagase, Yoshinori, 4,347,233, Cl. 424-7.000.
Kurisu, Toru: *See—*
Nakahara, Tsunamitsu; Aoki, Hiroshi; and Kurisu, Toru, 4,346,947, Cl. 308-9.000.
Kuroda, Masataka: *See—*
Miyata, Shigeo; and Kuroda, Masataka, 4,347,353, Cl. 528-485.000.

Kurpiewski, Joseph V., to General Battery Corporation. Vacuum actuated holding apparatus for a plastic welding machine. 4,346,874, Cl. 269-21.000.
Kurt Ehemann Spezialmaschinenfabrik KG: *See*—
Ehemann, Gero, 4,346,826, Cl. 223-70.000.
Kusunoki, Shigeru: *See*—
Nobue, Tomotaka; Kusunoki, Shigeru; Nishii, Kazunari; and Mori, Keijiro, 4,347,418, Cl. 219-10.55B.
Kusz, Maximillian, to Owens-Illinois, Inc. Two-piece closure having a child-resistant mode and a non child-resistant mode. 4,346,809, Cl. 215-214.000.
Kwanyuen, Prachuab: *See*—
Wildman, Samuel G.; and Kwanyuen, Prachuab, 4,347,324, Cl. 435-232.000.
Kwasnik, Hans-Jurgen; and Piduch, Hans-Gunter, to Dr. C. Otto & Comp. G.m.b.H. Coke side gantry car for a battery of coke ovens. 4,347,105, Cl. 202-263.000.
Kyowa Chemical Industry, Co., Ltd.: *See*—
Miyata, Shigeo; and Kuroda, Masataka, 4,347,353, Cl. 528-485.000.
Lace, Melvin A.: *See*—
Markus, Lawrence W.; Smejkal, George; and Lace, Melvin A., 4,346,854, Cl. 242-67.10R.
Lachmann, Helmut: *See*—
Kehrer, Wolfgang; and Lachmann, Helmut, 4,346,758, Cl. 165-134.00R.
Lacoste, Francois P. G., to Perkin-Elmer Corporation, The. Interferometric system. 4,347,000, Cl. 356-360.000.
LaFleur, Paul J., Jr.: *See*—
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Lindner, Henry, to Beatrice Foods Co., Div. of Elgin Molded Plastics. Display device. 4,346,868, Cl. 248-475.00R.
Lindstrom, Edgar K.: *See*—
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Mader, Reinhard, to Bayerische Motoren Werke. Carburetor for a multicylinder internal combustion engine and method of operation thereof. 4,346,682, Cl. 123-179.00G.
Madsen, Rud F.; Nielsen, W. Kofod; and Hansen, Ole, to Aktieselskabet de Danske Sukkerfabrikker. Liquid fuel composition, method of preparing said composition and emulsifier. 4,347,061, Cl. 44-51.000.
Maguire, Edward A.; and Gentilman, Richard L., to Raytheon Company. Method of forging spinel domes. 4,347,210, Cl. 264-294.000.
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Makizawa, Yoshiaki; Yamamoto, Katsuyuki; and Hata, Kanji, to Matsushita Electric Industrial Co., Ltd. Apparatus for mounting electronic components. 4,346,514, Cl. 29-740.000.
Malcolm, William R. Nozzle with orifice plate insert. 4,346,848, Cl. 239-596.000.
Malm, Robert N., to General Electric Company. Vehicle headlamp having an integral trim rim mounting assembly. 4,347,556, Cl. 362-307.000.
Malmin, Oscar. Hair replacement method. 4,346,713, Cl. 128-330.000.
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Manin, Michel G., to Compagnie Generale de Geophysique. Vapor implosion in a closed flexible enclosure. 4,346,779, Cl. 181-120.000.
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Markus, Lawrence W.; Smejkal, George; and Lace, Melvin A., to Extel Corporation. Printer paper take-up and storage device. 4,346,854, Cl. 242-67.10R.

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Martin, John H. Swimming pool inlet location control. 4,346,484, Cl. 4-507.000.

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Mathou, Marcel. Water-and/or sandbox construction. 4,346,885, Cl. 272-1.00A.

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Matsushita, Nobuo, to Toshiba Electric Equipment Corporation. Luminaire. 4,347,554, Cl. 362-297.000.

Matsushita, Toshihiko: *See*—
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Mattel, Inc.: *See*—
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Mattson, Charles A.; and Michel, James J., to Allegretti & Company. Snow thrower. 4,346,526, Cl. 37-259.000.

Mauduit, Francois M. Structure for affixing metallic wire to support posts. 4,346,871, Cl. 256-10.000.

Maue, Hans-Heinrich: *See*—
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Takanashi, Itsuo; Nakagaki, Shintaro; Miyoshi, Tadayoshi; Motoyama, Koichiro; Miyazaki, Kenichi; and Yokokawa, Sumio, 4,347,529, Cl. 358-44.000.
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Moyroud, Louis M., to Autologic, S.A. Photographic type composing machine with headlining attachment. 4,346,969, Cl. 354-7.000.
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Mueller, Richard A., to G. D. Searle & Co. Derivatives of α,β-unsaturated ketones. 4,347,192, Cl. 549-498.000.
Mukuda, Mutsuo; Murakami, Masahiro; and Aotsuka, Kazuo, to Sumitomo Precision Products Company Limited. Automatic pipe circumference welding apparatus. 4,347,421, Cl. 219-60.00A.
Mukunoki, Yasuo: *See*—
Takeuchi, Tetsuo; Mukunoki, Yasuo; and Minanizono, Junji, 4,347,308, Cl. 430-529.000.
Muller, Beat: *See*—
Lukaszczyk, Alfons; Martin, Henry; Diel, Peter J.; Fory, Werner; Gatzi, Karl; Kristinsson, Haukur; Muller, Beat; Muntwyler, Rene; Pachlatko, Johannes P.; Rempfler, Hermann; Schurter, Rolf; and Szczepanski, Henry, 4,347,372, Cl. 548-217.000.
Muller, Hans: *See*—
Goertler, Horst; Hetzel, Friedrich; Knobloch, Uwe; Muller, Hans; Prohaska, Hans; Rachner, Horst; and Spieth, Wolfgang, 4,347,465, Cl. 318-266.000.
Muller, Josef: *See*—
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Mullritter, Ludwig: *See*—
Geisslinger, Wolfgang; Pustka, Karel; Bronner, Hermann; Mullritter, Ludwig; and Vondrowski, Gabriel, 4,346,616, Cl. 192-84.00C.
Mune, Charles; and Krasij, Bohdan, to Carlingswitch, Inc. Multi-pole circuit breaker. 4,347,488, Cl. 335-9.000.
Muntwyler, Rene: *See*—
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Murakami, Hiroyasu: *See*—
Katsuma, Makoto; Suzuki, Masayuki; Shinbori, Kenichi; and Murakami, Hiroyasu, 4,346,973, Cl. 354-152.000.
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Murakami, Masatoshi, to Nippon Electric Co., Ltd. Digital multi-level multi-phase modulation communication system. 4,347,616, Cl. 375-20.000.
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Murano, Kazuo; Yamaguchi, Kazuo; Murakami, Norio; and Tsuda, Toshitaka, 4,347,617, Cl. 375-22.000.
Murakawa, Kyohei: *See*—
Yokouchi, Kishio; Ogawa, Hiromi; Yokoyama, Hiromitsu; Kamehara, Nobuo; Niwa, Koichi; and Murakawa, Kyohei, 4,346,516, Cl. 29-845.000.
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Murata Kikai Kabushiki Kaisha: *See*—
Yanobu, Hideo; and Tanaka, Tadashi, 4,346,551, Cl. 57-62.000.
Murata Manufacturing Co., Ltd.: *See*—
Tanaka, Yukio, 4,347,551, Cl. 361-307.000.
Murata, Masanori, to Nissan Motor Co., Ltd. Fitting structure for a tank. 4,346,865, Cl. 248-311.200.
Murdy, John: *See*—
Headley, Peter; Kelsey, Thomas; and Murdy, John, 4,347,414, Cl. 200-144.00R.
Murofushi, Satoru; Shibuya, Tadao; Kato, Shinichi; and Endo, Mitsuo, to Nissan Motor Co., Ltd.; and Yazaki Corporation. Device for detecting a burnt-out fuse. 4,347,504, Cl. 340-638.000.
Murphy, Alan P.; Smith, Rory J. M.; and Brooks, Maxim C., to Procter & Gamble Company, The. Spray-dried granular detergent compositions for improved greasy soil removal. 4,347,168, Cl. 252-547.000.
Murray, John T.: *See*—
Lodding, William F.; and Murray, John T., 4,346,515, Cl. 29-773.000.
Murray, Michael L. Foldable implement. 4,346,496, Cl. 15-185.000.
Mutai, Masahiko; Yokokura, Teruo; Kobayashi, Seizaburo; and Kato, Ikuo, to Kabushiki Kaisha Yakult Honsha. Antitumor agent containing *Lactobacillus casei* YIT 9018. 4,347,240, Cl. 424-92.000.
Muto, Naoki: *See*—
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Muto, Toshiaki: *See*—
Noritake, Yutaka; Kajitani, Ikuo; Arai, Sakuji; and Muto, Toshiaki, 4,347,219, Cl. 422-180.000.
Myers, Daniel E.: *See*—
Lombana, Luis A.; Myers, Daniel E.; and Albertson, Orris E., 4,347,156, Cl. 252-420.000.
Myers, Daniel J., to Nivison-Weiskopf Co., The. Roll dispenser carton. 4,346,829, Cl. 225-48.000.
Myers, George D.; and Busch, Lloyd E., to Ashland Oil, Inc. Carbometallic oil conversion with liquid water. 4,347,122, Cl. 208-113.000.
Mynard, Marie-Claude; and Tayot, Jean-Louis, to Societe Anonyme dite: Institut Merieux. Ganglioside containing compositions for treating diarrhea. 4,347,244, Cl. 424-180.000.
Nabisco Brands, Inc.: *See*—
Johnson, Richard A.; and Lloyd, Norman E., 4,347,322, Cl. 435-179.000.
Nagaoka, Kinnosuke; Kato, Tsumugu; and Nozawa, Mitsuru, to Ishizuka Glass Co., Ltd.; and Agency of Industrial Science and Technology. Method and device for reducing NO_x generated in glass-melting furnace. 4,347,072, Cl. 65-27.000.
Nagasaki, Michisuke; and Sannomiya, Shigehiro, to Yanmar Diesel Engine Co., Ltd. Planetary speed change gearing. 4,346,624, Cl. 74-784.000.
Nagase, Yoshinori; Shibatani, Kyoichiro; Yamauchi, Junichi; and Omura, Ikuo, to Kuraray Company, Limited. Cement compositions. 4,347,174, Cl. 523-116.000.
Nagase, Yoshinori: *See*—
Yamauchi, Junichi; Shibatani, Kyoichiro; Ikeguchi, Eiji; Omura, Ikuo; and Nagase, Yoshinori, 4,347,233, Cl. 424-7.000.
Nagatani, Kuniaki: *See*—
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Nagel, Gunter: *See*—
Gellert, Klaus; Nagel, Gunter; and Pollmeier, Franz J., 4,347,454, Cl. 310-193.000.
Nagel, Louis F. Pressure cooker canning unit. 4,346,836, Cl. 236-26.00A.
Nagele, Erwin: *See*—
Kienzle, Wolfgang; Paschke, Werner; and Nagele, Erwin, 4,346,589, Cl. 73-118.000.
Nakagaki, Sadao, to Yamajirushi Jozo Co., Ltd. Dehydrating method for a root vegetable and the like. 4,346,522, Cl. 34-12.000.
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Nakagiri, Takashi: *See*—
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Nakahara, Tsunamitsu; Aoki, Hiroshi; and Kurisu, Toru, to Citizen Watch Company Limited; Nakahara, Tsunamitsu; and Aoki, Hiroshi. Hydrostatic pressure gas-liquid double phase bearing. 4,346,947, Cl. 308-9.000.
Nakai, Masaaki: *See*—
Taniguchi, Nobuyuki; Nakai, Masaaki; Ishida, Tokuji; and Uchida, Isamu, 4,346,978, Cl. 354-289.000.
Nakajima, Junzo; Hida, Masayuki; and Horie, Masakatsu, to Fujitsu Limited. Electrophotographic recording device. 4,346,982, Cl. 355-3.00R.
Nakajima, Minoru: *See*—
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Nakamori, Shigeru: *See*—
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Nakamura, Akiyoshi; Ogura, Toshinobu; and Tanaka, Masahide, to Minolta Camera Co., Ltd. Compact lens system operable in different mediums. 4,346,966, Cl. 350-412.000.
Nakamura, Fuji, heir: *See*—
Nakamura, Takeo, deceased, 4,346,661, Cl. 110-259.000.
Nakamura, Hisako: *See*—
Nakamura, Katori; and Nakamura, Hisako, 4,346,574, Cl. 70-313.000.
Nakamura, Katori; and Nakamura, Hisako. Lock device of the pushbutton system. 4,346,574, Cl. 70-313.000.
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Ishizuka, Takashi; Moriyama, Yasuhiro; and Nakamura, Masao, 4,347,286, Cl. 428-349.000.
Nakamura, Susumu: *See*—
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Nakamura, Takeo, deceased (by Nakamura, Fuji, heir), to Osaka Gas Kabushiki Kaisha. Furnace for treating industrial wastes. 4,346,661, Cl. 110-259.000.
Nakamura, Toshiaki; and Kuramoto, Naoyuki, to Nissan Motor Co., Ltd. Noise resistant universal joint. 4,346,570, Cl. 464-120.000.
Nakamura, Yoshiyuki; Matsubara, Seiichi; Matsui, Takashi; Kumagai, Taiji; Senga, Taizo; and Fukutsu, Tsutomu, to Japan Metals & Chemicals Co., Ltd. Apparatus for refining ferrosilicon. 4,347,614, Cl. 373-77.000.
Nakane, Masanori: *See*—
Osumi, Yasuaki; Suzuki, Hiroshi; Kato, Akihiko; and Nakane, Masanori, 4,347,082, Cl. 75-171.000.
Nakatani, Mitsuo: *See*—
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Nalco Chemical Company: *See*—
Allain, Ronald J.; and Fong, Dodd W., 4,347,147, Cl. 252-33.300.
Boevink, Jan E.; Derrick, Arthur P.; and Moodie, John A., 4,347,339, Cl. 525-180.000.
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Namboodri, Chettoor G.: *See*—
Gregorian, Razmic S.; and Namboodri, Chettoor G., 4,347,145, Cl. 252-8.600.
Narco Bio-Systems, Inc.: *See*—
Childs, William C., deceased; Snook, Richard K.; and Lester, Douglas R., 4,346,604, Cl. 73-861.120.

Nartron Corporation: *See*—
Taylor, Robert E.; Rautiola, Norman A.; and Miller, Gerald K., 4,347,444, Cl. 307-141.000.

National Research Development Corporation: *See*—
Gardner, Keith; Pike, Edward R.; and Hill, David W., 4,346,991, Cl. 356-28.500.

National Steel Corporation: *See*—
Saunders, William T., 4,346,580, Cl. 72-344.000.

Natsui, Yoshinobu, to Nippon Electric Co., Ltd. Semiconductor memory device. 4,347,586, Cl. 365-174.000.

Nave, Peter: *See*—
Hofmann, Otto; Kroy, Walter; and Nave, Peter, 4,347,511, Cl. 343-5.0PC.

NCR Corporation: *See*—
Hardway, Jay B.; and Eichman, Larry W., 4,347,509, Cl. 340-778.000.

Neely, Noah A. Controlled fuel injection system. 4,346,689, Cl. 123-575.000.

Negishi, Takao; and Tomiita, Kazuo, to Toray Industries, Inc. Bulky textured multifilament yarn. 4,346,552, Cl. 57-208.000.

Neher, Robert; and Riniker, Bernhard, to Ciba-Geigy Corporation. Hypocalcaemic peptides and process for their manufacture. 4,347,242, Cl. 424-177.000.

Nelson, Gerald V.: *See*—
Ganster, Charles A.; and Nelson, Gerald V., 4,347,577, Cl. 364-501.000.

Nelson, Hugh W., to Combustion Engineering, Inc. Elimination of potassium compounds from sodium-based pulped cycles. 4,347,102, Cl. 162-35.000.

Nelson, Hugh W.; Prohazka, George J.; and Morris, Keith W., to Combustion Engineering, Inc. System for drying and burning viscous aqueous liquors which contain organics. 4,347,220, Cl. 422-185.000.

Nemethy, Mike Z. Method of making dental bridge using a prefabricated non-precious pontic. 4,346,750, Cl. 164-35.000.

Ngai, Mun-Hay. Record player. 4,347,595, Cl. 369-67.000.

Nguyen, Hiep: *See*—
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NHK Precision Co., Ltd.: *See*—
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NHK Spring Co., Ltd.: *See*—
Fuse, Takeshi; and Sekine, Masaru, 4,346,793, Cl. 188-134.000.

Nicely, Charles W.: *See*—
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Nichols, Richard D. E.: *See*—
Bianchi, John E.; and Nichols, Richard D. E., 4,346,827, Cl. 224-206.000.

Nicolau, Ion F., to Commissariat a l'Energie Atomique. Process for the preparation of alpha mercuric iodide monocrystals. 4,347,230, Cl. 423-491.000.

Nielsen, W. Kofod: *See*—
Madsen, Rud F.; Nielsen, W. Kofod; and Hansen, Ole, 4,347,061, Cl. 44-51.000.

Nienhaus, Harry A.: *See*—
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Nii, Yoshiji: *See*—
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Niigata Engineering Co., Ltd.: *See*—
Suzuki, Yoshio; and Shimizu, Masao, 4,347,259, Cl. 426-465.000.

Niimura, Tsutomu: *See*—
Yamakoshi, Akira; Murakami, Kyoichi; and Niimura, Tsutomu, 4,347,531, Cl. 358-172.000.

Niki, Motohiro. Water dispenser for small animals. 4,346,672, Cl. 119-72.500.

Nippon Electric Co., Ltd.: *See*—
Murakami, Masatoshi, 4,347,616, Cl. 375-20.000.
Natsui, Yoshinobu, 4,347,586, Cl. 365-174.000.

Nippon Hoso Kyokai: *See*—
Togami, Yuji, 4,347,112, Cl. 204-192.00M.

Nippon Oil Company, Ltd.: *See*—
Kojima, Ichiro; Maruhashi, Kenji; and Fujiwara, Yasuo, 4,347,184, Cl. 260-314.000.

Nippon Petrochemical Company: *See*—
Kajikawa, Teruo; and Iwai, Sakuya, 4,347,275, Cl. 428-95.000.

Nippon Petrochemicals Company, Limited: *See*—
Sato, Atsushi; Takahashi, Naoya; Endo, Keiji; and Yanagishita, Hitoshi, 4,347,169, Cl. 252-567.000.

Nippon Soken, Inc.: *See*—
Yasuda, Eturo; Segawa, Yoshihiro; and Ohta, Minoru, 4,346,585, Cl. 73-23.000.

Nippon Telegraph and Telephone Public Corporation: *See*—
Ito, Hiroko; Ohira, Eiji; and Ichikawa, Akira, 4,347,408, Cl. 179-84.0VF.
Ogawa, Seiki; Mito, Michio; and Shinoi, Tsuyoshi, 4,347,409, Cl. 179-99.00P.

Nippon Tsushin Kogyo Kabushiki Kaisha: *See*—
Ogawa, Seiki; Mito, Michio; and Shinoi, Tsuyoshi, 4,347,409, Cl. 179-99.00P.

Nippondenso Co., Ltd.: *See*—
Akiyama, Susumu; Ito, Kenzo; Fukaya, Hiroyasu; Ogisc, Haruhiko; Hirabayashi, Yuji; and Kawamura, Takahide, 4,347,570, Cl. 364-431.040.
Ohba, Masahiro, 4,347,544, Cl. 361-154.000.
Ueda, Mitsuru, 4,347,500, Cl. 340-388.000.

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Nishida, Takao; and Hirohata, Takashi, to Amchem Products, Inc. Process and composition for coating metals. 4,347,172, Cl. 524-319.000.

Nishigaki, Yuji: *See*—
Ishihara, Shunichi; Kitajima, Nobuo; Nishigaki, Yuji; and Kitahara, Nobuko, 4,347,296, Cl. 430-42.000.
Ishihara, Shunichi; Kitajima, Nobuo; Nishigaki, Yuji; and Kitahara, Nobuko, 4,347,297, Cl. 430-42.000.

Nishii, Kazunari: *See*—
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Nishimura, Shigeyuki: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; Shigehara, Itaru; Nagatani, Kuniaki; and Nishimura, Shigeyuki, 4,347,390, Cl. 570-202.000.

Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; Shigehara, Itaru; Nagatani, Kuniaki; and Nishimura, Shigeyuki, to Ishihara Sangyo Kaisha Ltd. Process for producing 1-bromo-3,5-dichlorobenzene. 4,347,390, Cl. 570-202.000.

Nishizawa, Jun-ichi, to Handotai Kenkyu Shinkokou. Method and apparatus for producing a multilayer semiconductor device utilizing liquid growth. 4,347,097, Cl. 156-622.000.

Nishizawa, Junichi; and Shimbo, Masafumi, to Zaidan Hojin Handotai Kenkyu Shinkokai; and Kabushiki Kaisha Daini Seikosha. Method of fabricating semiconductor integrated circuit device utilizing selective etching and epitaxial refill. 4,346,513, Cl. 29-580.000.

Nissan Motor Co., Ltd.: *See*—
Hirota, Yukitsugu; Endo, Akira; Kimura, Katsuhiro; Morozumi, Hiroshi; and Sekine, Kenji, 4,346,774, Cl. 180-167.000.
Iwata, Hidefumi; Tuchiya, Yoshimasa; and Iidaka, Toshiharu, 4,346,932, Cl. 296-216.000.
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Kimura, Shinji; Takao, Hiroshi; Ambe, Satoshi; and Akimune, Yoshio, 4,347,114, Cl. 204-195.00S.
Murata, Masanori, 4,346,865, Cl. 248-311.200.
Murofushi, Satoru; Shibuya, Tadao; Kato, Shinichi; and Endo, Mitsuo, 4,347,504, Cl. 340-638.000.
Nakamura, Toshiaki; and Kuramoto, Naoyuki, 4,346,570, Cl. 464-120.000.
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Nissin Kogyo Kabushiki Kaisha: *See*—
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Nittetsu Mining Co., Ltd.: *See*—
Shimoiizaka, Junzo; and Fujita, Toyohisa, 4,347,124, Cl. 209-1.000.

Nitto Electric Industrial Co., Ltd.: *See*—
Ishizuka, Takashi; Moriyama, Yasuhiro; and Nakamura, Masao, 4,347,286, Cl. 428-349.000.

Nivison-Weiskopf Co., The: *See*—
Myers, Daniel J., 4,346,829, Cl. 225-48.000.

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Nixon, Thomas J.; and Iley, Harold, to Harris Corporation. Voice alarm signalling system. 4,347,607, Cl. 370-110.100.

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Fischer, He..nann; Friese, Karl-Hermann; Gruber, Hans-Ulrich; Heinemann, Wolfgang; Knoll, Gunter; Linder, Ernst; Maurer, Helmut; Noack, Rainer; Steinke, Leo; Weber, Lothar; and Weyl, Helmut, 4,347,113, Cl. 204-195.00S.

Nobue, Tomotaka; Kusunoki, Shigeru; Nishii, Kazunari; and Mori, Keijiro, to Matsushita Electric Industrial Co., Ltd. Heat-cooking apparatus incorporating infrared detecting system. 4,347,418, Cl. 219-10.55B.

Nomura, Yoshiyuki: *See*—
Katsube, Hideo; Gamo, Gotaro; Nomura, Yoshiyuki; and Okuda, Kanemasa, 4,347,423, Cl. 219-69.00W.

Noonan, Robert P.: *See*—
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Norberg, Nils A.: *See*—
Ahlen, Karl G.; and Norberg, Nils A., 4,347,044, Cl. 417-253.000.

Norden Laboratories, Inc.: *See*—
Bass, Edmund P.; and Sharpee, Richard L., 4,347,239, Cl. 424-89.000.

Nordisk Ventilator Co., A/S: *See*—
Kristiansen, Svend H., 4,346,948, Cl. 308-219.000.

Nordson Corporation: *See*—
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Noritake, Yutaka; Kajitani, Ikuo; Arai, Sakuji; and Muto, Toshiaki, to Honda Giken Kogyo Kabushiki Kaisha. Catalytic converter for exhaust-gas cleaning use and method of assembling same. 4,347,219, Cl. 422-180.000.

Norlund, Bruce K.: *See*—
Moore, Robert A.; Norlund, Bruce K.; Kontrovitz, Harold S.; Robbins, Clayton B.; and Brooks, Jeffrey B., 4,347,525, Cl. 346-153.100.

Norman, Edward C.; and Dowell, Howard A., to Enterra Corporation. Protection against soiling. 4,347,266, Cl. 427-154.000.

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Kensinger, Robert A.; and Norman, Robert N., 4,347,576, Cl. 364-493.000.

Northern Engineering Industries, Limited: *See*—
Headley, Peter; Kelsey, Thomas; and Murdy, John, 4,347,414, Cl. 200-144.00R.
Northern Telecom, Inc.: *See*—
Suffi, Louis, 4,346,956, Cl. 339-119.00R.
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Black, David H. A.; Pelletier, Georges H.; and Lee, Hing F., 4,347,620, Cl. 375-112.000.
Northey, Charles R., to Grandeur Motorcar Corporation. Convertible car and method of making same. 4,346,930, Cl. 296-107.000.
Norwood Minerals, Inc.: *See*—
Dick, Perry J., Jr., 4,347,137, Cl. 210-329.000.
Nova-Handels AG: *See*—
Kneissl, Richard, 4,346,810, Cl. 215-237.000.
Nowlin, Duane D.: *See*—
Beckert, Adolf F.; Winberg, Dennis G; and Nowlin, Duane D., 4,347,224, Cl. 422-277.000.
Nozawa, Mitsuru: *See*—
Nagaoka, Kinnosuke; Kato, Tsumugu; and Nozawa, Mitsuru, 4,347,072, Cl. 65-27.000.
Nudenberg, Walter; Rim, Yong S.; and Matthews, Demetreos N., to Uniroyal, Inc. Activators for Ziegler type polymerization catalysts. 4,347,159, Cl. 252-429.00B.
Nuebling, George E., Sr. Board game featuring olympic sports. 4,346,899, Cl. 273-244.000.
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Stanton, George E., 4,346,620, Cl. 74-583.000.
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Turner, William A.; and Nunnelee, Johnny R., 4,347,013, Cl. 403-4.000.
N.V. Bekaert S.A.: *See*—
Haemers, Guy, 4,347,290, Cl. 428-625.000.
Nye, Norman H. Combustion engine with substantially constant compression. 4,346,677, Cl. 123-54.00B.
Obara, Haruki, to Fujitsu Fanuc Limited. Wire-cut, electric-discharge machining power source. 4,347,424, Cl. 219-69.00C.
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Occidental Oil Shale, Inc.: *See*—
Huijnen, Wilhelmus G. J., 4,346,935, Cl. 299-2.000.
Occidental Research Corporation: *See*—
Di Giacomo, Peter M., 4,347,125, Cl. 209-3.300.
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Dunshee, Wayne K.; and Odegaard, Janice B., 4,346,700, Cl. 128-155.000.
Odorzynski, Thomas W.; and Knott, Jack E., II, to American Can Company. Polyamide/polyethylene copolymer film and method for producing. 4,347,332, Cl. 524-169.000.
Ogawa, Hiromi: *See*—
Yokouchi, Kishio; Ogawa, Hiromi; Yokoyama, Hiromitsu; Kamehara, Nobuo; Niwa, Koichi; and Murakawa, Kyohei, 4,346,516, Cl. 29-845.000.
Ogawa, Kouhei, to Honda Giken Kogyo Kabushiki Kaisha. Carburetor. 4,347,195, Cl. 261-18.00R.
Ogawa, Mutsuo, to Ricoh Company, Ltd. Facsimile reading and recording device. 4,347,533, Cl. 358-296.000.
Ogawa, Seiki; Mito, Michio; and Shinoi, Tsuyoshi, to Nippon Telegraph and Telephone Public Corporation; and Nippon Tsushin Kogyo Kabushiki Kaisha. Key telephone system. 4,347,409, Cl. 179-99.00P.
Ogden, Ralph. Membrane switch control panel arrangement and label assembly for labeling same. 4,347,416, Cl. 200-317.000.
Ogilvie, Kelvin K., to ens BIO LOGICALS Inc. Ring open nucleoside analogues. 4,347,360, Cl. 544-276.000.
Ogiso, Haruhiko: *See*—
Akiyama, Susumu; Ito, Kenzo; Fukaya, Hiroyasu; Ogiso, Haruhiko; Hirabayashi, Yuji; and Kawamura, Takahide, 4,347,570, Cl. 364-431.040.
Ogita, Tadahisa: *See*—
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Ogura, Toshinobu: *See*—
Nakamura, Akiyoshi; Ogura, Toshinobu; and Tanaka, Masahide, 4,346,966, Cl. 350-412.000.
O'Hara, John W. Handy hanger molding clip. 4,346,866, Cl. 248-316.00B.
Ohara, Yuji, to Fuji Photo Film Co., Ltd. Laser recorder. 4,347,523, Cl. 346-108.000.
Ohba, Masahiro, to Nippondenso Co., Ltd. Injector drive circuit. 4,347,544, Cl. 361-154.000.
Ohira, Eiji: *See*—
Ito, Hiroko; Ohira, Eiji; and Ichikawa, Akira, 4,347,408, Cl. 179-84.0VF.
Ohkada, Shinzo; and Kenjo, Hideki, to Toray Industries, Ltd. Producing soft contact lenses. 4,347,198, Cl. 264-2.300.
Ohno, Shotaro; Koyama, Kenji; and Fukuda, Mitsutoshi, to Toyo Soda Manufacturing Co., Ltd. Method of separating serum albumin and gamma-globulin from each other. 4,347,138, Cl. 210-639.000.
Ohta, Minoru: *See*—
Yasuda, Eturo; Segawa, Yoshihiro; and Ohta, Minoru, 4,346,585, Cl. 73-23.000.
Ohta, Shigeo; and Suzuki, Takeo, to Alps Electric Co., Ltd. Amplifier equipped with circuit for preventing electrostatic breakdown. 4,347,482, Cl. 330-298.000.
Ohtsu Tire & Rubber Co., Ltd.: *See*—
Osada, Isao; and Sano, Shoichi, 4,346,747, Cl. 152-158.000.
Ohtsuga, Hisao; Uzawa, Koji; Kamuro, Takashi; Sudo, Susumu; Hirose, Tomoyoshi; Miyao, Masafumi; and Koga, Motoyuki. Device for preventing leakage at pipe joints. 4,346,922, Cl. 285-109.000.
Ohumi, Takeharu: *See*—
Inada, Masami; Ohumi, Takeharu; and Hashimoto, Kenji, 4,346,736, Cl. 137-625.480.
Oka, Hitoshi: *See*—
Sakurai, Hideki; Nakatani, Mitsuo; Oka, Hitoshi; Yokono, Hitoshi; and Isogai, Tokio, 4,347,304, Cl. 430-291.000.
Okada, Yasumasa, to Nissan Motor Co., Ltd. Handle device of lid opener mechanism. 4,346,925, Cl. 292-336.300.
Okamura, Kiyohito: *See*—
Yajima, Seishi; Okamura, Kiyohito; Hasegawa, Yoshio; and Yamamura, Takemi, 4,347,347, Cl. 528-30.000.
Okuda, Kanemasa: *See*—
Katsube, Hideo; Gamo, Gotaro; Nomura, Yoshiyuki; and Okuda, Kanemasa, 4,347,423, Cl. 219-69.00W.
Okutsu, Hiroyasu, to Pilot Man-Nen-Hitsu Kabushiki Kaisha. Duplication printer. 4,346,657, Cl. 101-269.000.
Okuyama, Hidetoshi: *See*—
Touyama, Ryousuke; Inouye, Hiroyuki; Shingu, Tetsuro; Takeda, Yoshio; Ikumoto, Takeshi; Okuyama, Hidetoshi; and Yamamoto, Osamu, 4,347,356, Cl. 542-430.000.
Olashaw, William F., to General Electric Company. Structural frame corner assembly for electrical switchboards and the like. 4,347,015, Cl. 403-219.000.
Olenick, John G.; and Lorenz, Patrick E., to United States of America, Army. Float device for density gradient fractionation. 4,346,608, Cl. 73-863.210.
Olympus Optical Co., Ltd.: *See*—
Kimura, Kenji, 4,347,534, Cl. 360-77.000.
Osanai, Akira, 4,346,859, Cl. 242-201.000.
Takagi, Takeji; and Hosaka, Kiyokazu, 4,347,204, Cl. 264-127.000.
Omura, Ikuo: *See*—
Nagase, Yoshinori; Shibatani, Kyoichiro; Yamauchi, Junichi; and Omura, Ikuo, 4,347,174, Cl. 523-116.000.
Yamauchi, Junichi; Shibatani, Kyoichiro; Ikeguchi, Eiji; Omura, Ikuo; and Nagase, Yoshinori, 4,347,233, Cl. 424-7.000.
Ong, S. Christine; and Bright, Margaret N., to Mobil Oil Corporation. Oriented p-methyl styrene polymer. 4,347,344, Cl. 526-347.100.
Ono, Masao: *See*—
Abe, Kunio; Saito, Masatsugu; Ono, Masao; and Ikedo, Yuji, 4,347,596, Cl. 369-72.000.
Ono, Syoji; Miura, Shuzi; and Yoshida, Tsunemasa, to Teijin Limited. Process for the preparation of immunogammaglobulin using trithionate compounds. 4,347,179, Cl. 260-112.00B.
Ooba, Osamu. Blade type focal plane shutter. 4,346,977, Cl. 354-246.000.
O'Rear, Dennis J.: *See*—
Mayer, Jerome F.; Miller, Stephen J.; and O'Rear, Dennis J., 4,347,121, Cl. 208-58.000.
Oridoroga, Valentin A.: *See*—
Yasnitsky, Boris G.; Tsukanova, Galina M.; Oridoroga, Valentin A.; and Furmanov, Jury A., 4,347,056, Cl. 8-116.00R.
Yasnitsky, Boris G.; Tsukanova, Galina M.; Oridoroga, Valentin A.; and Furmanov, Jury A., 4,347,057, Cl. 8-116.00R.
Orion-yhtyma Oy: *See*—
Tanskanen, Paavo T., 4,347,236, Cl. 424-45.000.
Orlowski, Gerald J.; and Dugle, Thomas, to Armour and Company. Apparatus for applying pressure in a vertical direction. 4,346,654, Cl. 100-268.000.
Orpana, Veikko: *See*—
Knudsen, Niels; Orpana, Veikko; Wisur, Matti; Warulf, Olov; Bergqvist, Hakan; and Afzelius, Raoul, 4,347,401, Cl. 174-14.00R.
Osada, Isao; and Sano, Shoichi, to Ohtsu Tire & Rubber Co., Ltd.; and Honda Giken Kogyo Kabushiki Kaisha. Run-flat support and tire assembly. 4,346,747, Cl. 152-158.000.
Osaka Gas Kabushiki Kaisha: *See*—
Nakamura, Takeo, deceased, 4,346,661, Cl. 110-259:000.
Osanai, Akira, to Olympus Optical Co., Ltd. Tape recorder. 4,346,859, Cl. 242-201.000.
Osawa Precision Industries, Ltd.: *See*—
Isono, Tadao, 4,346,975, Cl. 354-195.000.
Osumi, Yasuaki; Suzuki, Hiroshi; Kato, Akihiko; and Nakane, Masanori, to Agency of Industrial Science and Technology; and Ministry of International Trade and Industry. Mischmetal alloy for storage of hydrogen. 4,347,082, Cl. 75-171.000.
Ota, Hiroshi: *See*—
Asano, Hiroaki; Ota, Hiroshi; and Yamakage, Kenji, 4,346,535, Cl. 51-101.00R.
Ota, Naoto: *See*—
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Kohzai, Yoshinori; Fujioka, Yoshiki; and Ota, Naoto, 4,347,471, Cl. 318-616.000.
Otis Elevator Company: *See*—
Shung, Wu S., 4,346,788, Cl. 187-29.00R.
Ottoson, Allen E., to Vee Arc Corporation. Motor controlling. 4,347,466, Cl. 318-301.000.
Outboard Marine Corporation: *See*—
Anderson, Philip A., 4,346,690, Cl. 123-599.000.
Owen, Geoffrey R.: *See*—
Durant, Graham J.; Ganellin, Charon R.; Owen, Geoffrey R.; and Young, Rodney C., 4,347,250, Cl. 424-263.000.

Owens-Corning Fiberglas Corporation: *See—*
Aubourg, Patrick F.; and Proyster, Mark A., 4,347,073, Cl. 65-28.000.
Flautt, Martin C.; Wong, Robert; and Walsh, Joseph F., 4,347,278, Cl. 428-288.000.
Shannon, Richard F., 4,347,271, Cl. 428-36.000.
Uffner, William E., 4,347,171, Cl. 524-71.000.
Owens-Illinois, Inc.: *See—*
Kusz, Maximillian, 4,346,809, Cl. 215-214.000.
Moan, Kenneth L., 4,346,694, Cl. 126-443.000.
Owings, Allen J. Method for locating the depth of a drill string washout or lost circulation zone. 4,346,594, Cl. 73-155.000.
Oxford Medical Systems Limited: *See—*
Morris, Julian R. W., 4,346,718, Cl. 128-710.000.
Oxley, Vincent C.: *See—*
Chen, Wen T.; and Oxley, Vincent C., 4,347,541, Cl. 361-50.000.
Oxy Metal Industries Corporation: *See—*
Galloway, James H., 4,347,562, Cl. 363-87.000.
Oya, Masayuki: *See—*
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Ozaki, Hideaki: *See—*
Ishigaki, Yukinobu; and Ozaki, Hideaki, 4,347,510, Cl. 340-825.500.
Ozaki, Masaru: *See—*
Shiga, Tetsuo; Ozaki, Masaru; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, 4,347,310, Cl. 430-620.000.
Ozawa, Hiroshi; and Tokumoto, Masao, to Minolta Camera Kabushiki Kaisha. Method of controlling toner concentration for electrophotographic copying apparatus. 4,347,299, Cl. 430-122.000.
P.M. America, Inc.: *See—*
Chase, Charles; Walters, Stephen; and Meador, Richard E., 4,346,742, Cl. 141-1.000.
Pachlatko, Johannes P.: *See—*
Lukaszczyk, Alfons; Martin, Henry; Diel, Peter J.; Fory, Werner; Gatzi, Karl; Kristinsson, Haukur; Muller, Beat; Muntwyler, Rene; Pachlatko, Johannes P.; Rempfler, Hermann; Schurter, Rolf; and Szczepanski, Henry, 4,347,372, Cl. 548-217.000.
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Package Machinery Company: *See—*
Crescenzo, Francis C.; and LaFleur, Paul J., Jr., 4,346,545, Cl. 53-234.000.
Packschies, Heinz; Feldman, Wilhelm; and Hankel, Albert, to Mannesmann Aktiengesellschaft. Purging pipes under noise-attenuating conditions. 4,346,780, Cl. 181-198.000.
Paddison, Gary W.: *See—*
McLaughlin, Albert J.; and Paddison, Gary W., 4,346,599, Cl. 73-597.000.
Paetsch, Juergen: *See—*
Gramlich, Walter; Hoffmann, Werner; Hupfer, Leopold; Meissner, Bernd; and Paetsch, Juergen, 4,347,388, Cl. 568-840.000.
Paietta, Fausto, to C.M.E. F. Lli Paietta. Device for automatic rewinding of material delivered in sheets in heliographic and similar machines. 4,346,856, Cl. 242-74.000.
Pako Corporation: *See—*
Kaufmann, Kenneth M., 4,346,981, Cl. 354-324.000.
Palazzolo, James C. Silver recovery system for X-ray and photographic film processors. 4,346,980, Cl. 354-322.000.
Pallos, Ferenc M., to Stauffer Chemical Company. N-Acylsulfonamide herbicidal antidotes. 4,347,380, Cl. 564-91.000.
Palmer, William J.: *See—*
Kubalak, Thomas P.; Berghoff, Gene M.; and Palmer, William J., 4,347,496, Cl. 340-52.00R.
Paparizos, Christos: *See—*
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Paranjpe, Suresh C.; Davis, James W.; Scranton, Robert J.; and Wells, Roger D., to Mead Corporation, The. Ink jet printer. 4,347,520, Cl. 346-75.000.
Paredes, Candelario; and Slater, Billy R., to Forney Engineering Company. Industrial control system. 4,347,563, Cl. 364-137.000.
Park, Chung P., to Dow Chemical Company, The. Expandable polyolefin compositions and polyolefin foam preparation process. 4,347,329, Cl. 521-79.000.
Park, John N.; and Steigerwald, Robert L., to General Electric Company. FET Motor drive system. 4,347,464, Cl. 318-254.000.
Park, Sang M.: *See—*
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Parker, DeRay: *See—*
Jones, Donald E.; Parker, DeRay; and Boren, Paul R., 4,346,511, Cl. 29-458.000.
Parker, Robert W.: *See—*
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Parsons, David, to Automotive Products Limited. Fluid pressure servomotor. 4,346,573, Cl. 70-264.000.
Parsons, Ward H. Method of and apparatus for determining with precision the payload of a water borne vessel. 4,347,574, Cl. 364-463.000.
Partus, Fred P.: *See—*
Haney, Eugene A.; and Partus, Fred P., 4,347,069, Cl. 65-3.120.
Paschke, Werner: *See—*
Kienzle, Wolfgang; Paschke, Werner; and Nagele, Erwin, 4,346,589, Cl. 73-118.000.
Patchett, Arthur A.; and Greenlee, William J., to Merck & Co., Inc. Process for preparing amino acids and esters. 4,347,375, Cl. 548-344.000.
Pate, James E.: *See—*
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Patel, Ramesh N.: *See—*
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Patrick, Carl D.: *See—*
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Patrick, William P.: *See—*
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Pawloski, Chester E.: *See—*
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Payne, David A.; and Park, Sang M., to University of Illinois Foundation. Fine-grain semiconducting ceramic compositions. 4,347,167, Cl. 252-520.000.
Payne, Robert D.: *See—*
Stamets, Stanley L.; Winkless, Robert A.; Hernandez, Rafael J.; Merle, Joseph J.; and Payne, Robert D., 4,346,667, Cl. 118-622.000.
Peabody, Ralph C.; and Sundberg, Bertil J. Brush structure. 4,346,494, Cl. 15-179.000.
Pearce, Charles W.; and Schmidt, Paul F., to Bell Telephone Laboratories, Inc.; and Western Electric Company, Inc. Diffusion furnace. 4,347,431, Cl. 219-390.000.
Pearcy, Robert E.; and Raus, James E., to Western Electric Company, Inc. Assembly of electrical components with substrates. 4,347,552, Cl. 361-398.000.
Peerbolte, Gerrit H.: *See—*
Heerens, Willem C.; and Peerbolte, Gerrit H., 4,347,478, Cl. 324-61.00R.
Pekkarinen, Michael O.; and Shim, Norm, to Baxter Travenol Laboratories, Inc. Metering apparatus having rate compensation circuit. 4,346,705, Cl. 128-214.00F.
Pelletier, Georges H.: *See—*
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Pennwalt Corporation: *See—*
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Perkin-Elmer Corporation, The: *See—*
Lacoste, Francois P. G., 4,347,000, Cl. 356-360.000.
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Perkins, Leroy M.: *See—*
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Perkow, Helmut: *See—*
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Perobelli, Aldo: *See—*
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Perrone, Terrence J.; Bolton, Theodore S.; and Caronna, Cosimo, to Carrier Corporation. Method and apparatus for securing tubes in an air conditioning unit. 4,346,568, Cl. 62-259.100.
Persson, Per-olof G.; and Goterdal, Gote A., to Flintab Vagsystem AB. Low-profile, non-platform weigh scale. 4,346,771, Cl. 177-145.000.
Pessina, Giorgio; and Perobelli, Aldo. Jogging device. 4,346,882, Cl. 271-221.000.
Peter, Donald: *See—*
Hooper, David C.; Johnson, George A.; Peter, Donald; and Rennie, George K., 4,347,153, Cl. 252-174.250.
Peters, Gunter. Truck with loading platform and body. 4,346,929, Cl. 296-36.000.
Peters, Klaus-Jurgen; Krauss, Rudolf; and Binggeser, Ernst, to Robert Bosch GmbH. Method for producing curved valve needles. 4,346,577, Cl. 72-129.000.
Peters, Thomas E.: *See—*
Henckel, David J.; and Peters, Thomas E., 4,347,202, Cl. 264-24.000.
Peterson, Charles A.; and Innis, Robert T., to Westinghouse Electric Corp. Electrical equipment protective apparatus with energy balancing among parallel varistors. 4,347,539, Cl. 361-16.000.
Peterson, David A., to Prem Magnetics, Inc. Low profile transformer. 4,347,490, Cl. 336-60.000.
Peterson, Paul D. Planter. 4,346,532, Cl. 47-66.000.
Petkoff, Alex. Cleaning device for eyeglasses. 4,347,010, Cl. 401-10.000.
Peyronel, Jean-Francois: *See—*
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Phillips, Arthur P., to Burroughs Wellcome Co. Compounds and methods of making them. 4,347,177, Cl. 260-112.00B.
Phillips Petroleum Company: *See—*
Dietz, Richard E.; and McDaniel, Max P., 4,347,161, Cl. 252-429.00B.

Hubby, John S., 4,347,098, Cl. 159-16.00S.
Scoggin, Jack S., 4,347,385, Cl. 568-72.000.
Phillips, Raymond J.: *See—*
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Piccone, Vincent A.: *See—*
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Pickering & Company, Inc.: *See—*
Chass, Jacob, 4,347,491, Cl. 336-135.000.
Piduch, Hans-Gunter: *See—*
Kwasnik, Hans-Jurgen; and Piduch, Hans-Gunter, 4,347,105, Cl. 202-263.000.
Pierce, Stanley L., to Ford Motor Company. Four speed transaxle with mid-position transfer drive. 4,346,622, Cl. 74-688.000.
Pierrel S.p.A.: *See—*
Giobbio, Vincenzo; and Buracchi, Livio, 4,347,247, Cl. 424-250.000.
Pieszek, Wolfgang A.: *See—*
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Pieters, Wim J.: *See—*
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Pike, Edward R.: *See—*
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Pilot Man-Nen-Hitsu Kabushiki Kaisha: *See—*
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Pioneer Electronic Corporation: *See—*
Abe, Kunio; Saito, Masatsugu; Ono, Masao; and Ikedo, Yuji, 4,347,596, Cl. 369-72.000.
Arakawa, Fumio, 4,347,598, Cl. 369-254.000.
Saito, Masaki; and Kanazashi, Tetuo, 4,347,604, Cl. 370-85.000.
Ueno, Hitoshi; Yazaki, Shirokazu; and Ayukawa, Yukitada, 4,346,950, Cl. 312-138.00R.
Pipeline Service: *See—*
Bayen, Jean; and Scemama, Patrick, 4,346,726, Cl. 137-15.000.
Pirkle, James C., Jr.: *See—*
Funk, Edward W.; May, Walter G.; and Pirkle, James C., Jr., 4,347,118, Cl. 208-11.0LE.
Pitney Bowes, Inc.: *See—*
Duwel, Edward C.; and Soderberg, John H., 4,347,506, Cl. 340-679.000.
Pivirotto, Thomas J.: *See—*
United States of America, National Aeronautics and Space Administration; and Pivirotto, Thomas J., 4,347,613, Cl. 372-56.000.
Plachno, Robert S., to Mostek Corporation. Buffer circuit for semiconductor memory. 4,347,448, Cl. 307-583.000.
Plantard, Dominique: *See—*
Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, 4,347,070, Cl. 65-9.000.
Platts, Stanley A., to Unishear Mixers Limited. Mixing apparatus. 4,347,004, Cl. 366-137.000.
Pleschiutschnigg, Fritz-Peter: *See—*
Mezger, Sepp; Lerch, Kurt; Schrewe, Hans; and Pleschiutschnigg, Fritz-Peter, 4,346,724, Cl. 134-122.00R.
Plessey Overseas Limited: *See—*
Ash, Christopher P., 4,347,615, Cl. 375-14.000.
Poggio, Cesare: *See—*
Appiano, Silvano; Di Pino, Duccio; and Poggio, Cesare, 4,347,608, Cl. 371-16.000.
Pohl, Walter J.: *See—*
Alley, Robert P.; Pohl, Walter J.; and Relyea, John W., 4,346,755, Cl. 165-17.000.
McCarty, William J.; Pohl, Walter J.; and McCreary, Russell L., 4,346,566, Cl. 62-159.000.
Pohler, Friedmar; Falk, Hans; Muller, Josef; Klein, Hans J.; and Hoffacker, Franz, to Agfa-Gevaert Aktiengesellschaft. Apparatus for the contact-free continuous measurement and monitoring of magnetic tracks on moving film strips. 4,346,668, Cl. 118-665.000.
Polaroid Corporation: *See—*
Johnson, Bruce K.; and Whiteside, George D., 4,346,971, Cl. 354-34.000.
Kliem, Peter O., 4,347,301, Cl. 430-215.000.
Polito, Alan J.; and Bray, Kurtis R., to Beckman Instruments, Inc. Thyroid polarization fluoroimmunoassay. 4,347,058, Cl. 23-230.00B.
Polito, Alan J.; and Bray, Kurtis R., to Beckman Instruments, Inc. T_3 Uptake polarization fluoroimmunoassay. 4,347,059, Cl. 23-230.00B.
Polk, Donald E.: *See—*
Ray, Ranjan; Polk, Donald E.; and Giessen, Bill C., 4,347,076, Cl. 75-0.50R.
Pollmeier, Franz J.: *See—*
Gellert, Klaus; Nagel, Gunter; and Pollmeier, Franz J., 4,347,454, Cl. 310-193.000.
Polychrome Corporation: *See—*
Shimazu, Ken-Ichi; and Nakayama, Takao, 4,347,300, Cl. 430-156.000.
Poole, Leonard. Donkey calf exercising machine. 4,346,887, Cl. 272-117.000.
Popper Engineering Ltd.: *See—*
Popper, Jakhin B., 4,346,802, Cl. 198-533.000.
Popper, Jakhin B., to Popper Engineering Ltd. Combination anti-bridging device and vibrating tray. 4,346,802, Cl. 198-533.000.
Porter, David R., to Boeing Company, The. Fiber optic T coupler. 4,346,961, Cl. 350-96.160.
Posch, Oskar, to Anstalt Mura. Apparatus for making carbon black. 4,347,218, Cl. 422-151.000.
Possell, Clarence R. Method for pumping slurry and apparatus for use therewith. 4,347,032, Cl. 415-90.000.
Possell, Clarence R. Concrete pump and method of using same. 4,347,033, Cl. 415-90.000.
Post Office, The: *See—*
France, Paul W., 4,346,601, Cl. 73-829.000.
Post, Paul C.: *See—*
Kavouras, Stephen P.; Post, Paul C.; Wells, Roderick A.; and Rutkowski, Stephen L., 4,347,618, Cl. 375-37.000.
Potapova, Tamara P.: *See—*
Shustova, Olga A.; Gladyshev, Georgy P.; and Potapova, Tamara P., 4,347,175, Cl. 523-455.000.
Potier, Pierre; Langlois, Nicole; Langlois, Yves; Andriamialisoa, Ratremaniaina Z.; and Mangeney, Pierre, to Agence Nationale de Valorisation de la Recherche (ANVAR). Class of seco bis-indolic compounds which can be used as drugs and a process for the preparation thereof. 4,347,249, Cl. 424-262.000.
Powderly, John, to USM Corporation. Storing and handling of hollow rivets. 4,346,804, Cl. 206-338.000.
PPG Industries, Inc.: *See—*
Blizzard, Roy L.; and Martin, Thomas O., 4,347,060, Cl. 23-294.00R.
Pratt & Whitney Aircraft of Canada Limited: *See—*
Tedstone, Donald J., 4,346,860, Cl. 244-53.00B.
Pray, Edward R.: *See—*
Demou, John G.; Pray, Edward R.; and McBrayer, Robert L., 4,347,330, Cl. 521-110.000.
Precision Metal Fabricators, Inc.: *See—*
Lenhart, Ronald A., 4,347,022, Cl. 406-88.000.
Prem Magnetics, Inc.: *See—*
Peterson, David A., 4,347,490, Cl. 336-60.000.
Pretti, Rudy: *See—*
Kraus, Roger B.; and Pretti, Rudy, 4,346,491, Cl. 10-111.000.
Price, John E., to Amdahl Corporation. Emitter coupled logic circuit with active pull-down. 4,347,446, Cl. 307-443.000.
Procter & Gamble Company, The: *See—*
Murphy, Alan P.; Smith, Rory J. M.; and Brooks, Maxim C., 4,347,168, Cl. 252-547.000.
Proebsting, Robert J., to Mostek Corporation. Current limiting MOS transistor driver circuit. 4,347,447, Cl. 307-548.000.
Proebsting, Robert J., to Mostek Corporation. Refresh counter test. 4,347,589, Cl. 365-222.000.
Proelss, Henning F., to Boehringer Mannheim GmbH. Analytical determination of lipase. 4,347,313, Cl. 435-19.000.
Prohaska, Hans: *See—*
Goertler, Horst; Hetzel, Friedrich; Knobloch, Uwe; Muller, Hans; Prohaska, Hans; Rachner, Horst; and Spieth, Wolfgang, 4,347,465, Cl. 318-266.000.
Prohazka, George J.: *See—*
Nelson, Hugh W.; Prohazka, George J.; and Morris, Keith W., 4,347,220, Cl. 422-185.000.
Propster, Mark A.: *See—*
Aubourg, Patrick F.; and Propster, Mark A., 4,347,073, Cl. 65-28.000.
PTX-Dentronix, Inc.: *See—*
DeSantis, Raymond P., 4,347,051, Cl. 425-78.000.
Pure Power Incorporated: *See—*
Mayo, Alfred M.; and Convers, Charles C., 4,347,093, Cl. 156-242.000.
Puro Corporation: *See—*
Rosen, Robert A.; Schuchmann, Gayle F.; and Pate, James E., 4,346,483, Cl. 4-227.000.
Puschnerat, Helmut: *See—*
Schwaab, Manfred; Puschnerat, Helmut; and Storz, Kurt, 4,346,656, Cl. 101-181.000.
Pustka, Karel: *See—*
Geisslinger, Wolfgang; Pustka, Karel; Bronner, Hermann; Mullritter, Ludwig; and Vondrowski, Gabriel, 4,346,616, Cl. 192-84.00C.
Quach, Hoa: *See—*
Lewis, Armand F.; Ma, Chen-Chi M.; Quach, Hoa; and Krasnicki, Edward J., 4,347,287, Cl. 428-378.000.
Quick, James E.; Razdan, Raj K.; and Dalzell, Haldean C., to SISA, Incorporated. 4,5α-Epoxy-3-hydroxy or methoxy-7-(1-hydroxy-alkyl or 1-oxoalkyl)morphinan-6-one compounds. 4,347,361, Cl. 546-45.000.
Quirin, Michel: *See—*
Wattron, Albert; and Quirin, Michel, 4,346,549, Cl. 56-370.000.
Rachner, Horst: *See—*
Goertler, Horst; Hetzel, Friedrich; Knobloch, Uwe; Muller, Hans; Prohaska, Hans; Rachner, Horst; and Spieth, Wolfgang, 4,347,465, Cl. 318-266.000.
Radkins, Andrew P.; Macarus, David P.; Radkins, James A.; and Waxman, Jay S., to Genieco Inc. Incense holder. 4,347,217, Cl. 422-126.000.
Radkins, James A.: *See—*
Radkins, Andrew P.; Macarus, David P.; Radkins, James A.; and Waxman, Jay S., 4,347,217, Cl. 422-126.000.
Rainey, Paul N.: *See—*
Cox, Alan W.; and Rainey, Paul N., 4,346,886, Cl. 272-72.000.

Raisin, Jean-Pierre: *See*—
Doyen, Joel; and Raisin, Jean-Pierre, 4,346,877, Cl. 271-19.000.
Ram Handler, Ltd.: *See*—
Wagner, Robert L., 4,346,671, Cl. 119-60.000.
Ranco Incorporated: *See*—
Gemma, Mario; and Baehr, Burghard, 4,346,564, Cl. 62-140.000.
Rand, John H., to United States of America, Army. Liquid sampler. 4,346,612, Cl. 73-864.440.
Rao, G. R. Mohan, to Texas Instruments Incorporated. Semiconductor integrated circuit memory device with both serial and random access arrays. 4,347,587, Cl. 365-189.000.
Rapier, Pascal M., to United States of America, Energy. Multi-stage flash degaser. 4,346,560, Cl. 60-641.300.
Rashbrook, Robert B.: *See*—
Horner, Patrick J.; and Rashbrook, Robert B., 4,347,350, Cl. 528-190.000.
Raue, Donald J.: *See*—
Skladzien, Stanley B.; and Raue, Donald J., 4,346,605, Cl. 73-861.130.
Raus, James E.: *See*—
Pearcy, Robert E.; and Raus, James E., 4,347,552, Cl. 361-398.000.
Rautiola, Norman A.: *See*—
Taylor, Robert E.; Rautiola, Norman A.; and Miller, Gerald K., 4,347,444, Cl. 307-141.000.
Ray, John G.: *See*—
Latassa, Frank M.; and Ray, John G., 4,347,460, Cl. 315-63.000.
Ray, Ranjan; Polk, Donald E.; and Giessen, Bill C., to Marko Materials, Inc. Aluminum-transition metal alloys made using rapidly solidified powers and method. 4,347,076, Cl. 75-0.50R.
Raychem Corporation: *See*—
Martin, Albert R., 4,347,487, Cl. 333-1.000.
Raymor, Roger F.; and Adams, Les, to Seligco Food Corporation. Frozen food container. 4,346,815, Cl. 220-306.000.
Raytheon Company: *See*—
Liang, Victor K. C.; Bouyssoundère, Bernard; and Yim, Ernest W., 4,346,512, Cl. 29-571.000.
Maguire, Edward A.; and Gentilman, Richard L., 4,347,210, Cl. 264-294.000.
Raz, Zeev, to Ben-Gurion University of the Negev, a part interest. Water faucet and attachment therefor. 4,346,735, Cl. 137-606.000.
Razdan, Raj K.: *See*—
Quick, James E.; Razdan, Raj K.; and Dalzell, Haldean C., 4,347,361, Cl. 546-45.000.
RCA Corporation: *See*—
Benner, Timothy E., 4,347,459, Cl. 313-383.000.
Botez, Dan, 4,347,486, Cl. 372-46.000.
Speer, Walter F., 4,347,628, Cl. 455-173.000.
Tomasetti, Charles M.; and Ulaky, John A., 4,347,458, Cl. 313-103.00R.
Redder, Manfred; and Grundken, Dieter, to Gewerkschaft Eisenhutte Westfalia. Lubricating sprocket drum mounting. 4,346,801, Cl. 198-500.000.
Redifon Simulation Limited: *See*—
Spooner, Archer M., 4,347,507, Cl. 340-705.000.
Spooner, Archer M., 4,347,508, Cl. 340-705.000.
Redwine, Michael A.: *See*—
Reed, Stewart D.; Sills, Arthur A.; Kraft, John H.; Houle, Raymond T.; Redwine, Michael A.; and Kilbourn, Frederick A., 4,346,485, Cl. 4-555.000.
Reed International Limited: *See*—
Gill, Anthony; Gosden, John; and Parker, Robert W., 4,346,921, Cl. 285-110.000.
Reed, Robert D.; Martin, Richard R.; and Goodnight, Hershel E., to John Zink Company. Low NOX burner. 4,347,052, Cl. 431-188.000.
Reed, Stewart D.; Sills, Arthur A.; Kraft, John H.; Houle, Raymond T.; Redwine, Michael A.; and Kilbourn, Frederick A., to Silchor. Apparatus and method for bathing invalids. 4,346,485, Cl. 4-555.000.
Reh, Lothar; Hirsch, Martin; Baron, Gerhard; Blaum, Eberhard; and Hafke, Carl, to Metallgesellschaft Aktiengesellschaft. Process of gasifying fine-grained solid fuels. 4,347,064, Cl. 48-197.00R.
Reilly, Edward J.: *See*—
Williams, Glenn L.; and Reilly, Edward J., 4,347,518, Cl. 346-1.100.
Reinsch, A. O. Winfried. Flash jet coolant pumping system. 4,347,623, Cl. 376-392.000.
Relyea, John W.: *See*—
Alley, Robert P.; Pohl, Walter J.; and Relyea, John W., 4,346,755, Cl. 165-17.000.
Remcor Products Company: *See*—
Miller, Benjamin D.; and Schafer, Albert L., 4,346,824, Cl. 222-504.000.
Rempfler, Hermann: *See*—
Lukaszczyk, Alfons; Martin, Henry; Diel, Peter J.; Fory, Werner; Gatzi, Karl; Kristinsson, Haukur; Muller, Beat; Muntwyler, Rene; Pachlatko, Johannes P.; Rempfler, Hermann; Schurter, Rolf; and Szczepanski, Henry, 4,347,372, Cl. 548-217.000.
Rende, Dominic S., to Nalco Chemical Company. Method for sulfite pulping using water-soluble molybdenum-containing compounds as catalysts. 4,347,103, Cl. 162-79.000.
Rendl, Rene. Spark plug wrench adapted for adjustable torque. 4,346,633, Cl. 81-475.000.
Rennie, George K.: *See*—
Hooper, David C.; Johnson, George A.; Peter, Donald; and Rennie, George K., 4,347,153, Cl. 252-174.250.
Rensselaer Polytechnic Institute: *See*—
Scarton, Henry A.; Kennedy, Warren C.; Gaylo, Keith R.; and Capian, Clark R., 4,346,783, Cl. 181-230.000.
Rentmeester, Kenneth R., to American Can Company. Side seam stripes. 4,346,814, Cl. 220-75.000.
Research Corporation: *See*—
Schneider, Morris D., 4,347,243, Cl. 424-177.000.
Research Products Corporation: *See*—
Cox, Randolph B., 4,347,197, Cl. 261-106.000.
Research Triangle Institute: *See*—
Brown, Rodney J.; and Swaisgood, Harold E., 4,347,312, Cl. 435-7.000.
Restelli, Amedeo A., to Societa Italiana Catene Calibrate Regina S.p.A. Motor unit for bicycles. 4,346,777, Cl. 180-220.000.
Rethread, Inc.: *See*—
Kraus, Roger B.; and Pretti, Rudy, 4,346,491, Cl. 10-111.000.
Reusch, Rudolf: *See*—
Trost, Elmar; and Reusch, Rudolf, 4,346,993, Cl. 356-138.000.
Reyners, Thierry. Cable splice enclosures and method of use. 4,347,402, Cl. 174-91.000.
Reynolds, Thomas J.: *See*—
Latimer, John P.; Donaldson, Robert; Cross, Michael; MacPhaiden, Harold; Skiles, Loren D.; Schauer, Henry; and Reynolds, Thomas J., 4,347,029, Cl. 414-22.000.
Rheinmetall GmbH: *See*—
Trost, Elmar; and Reusch, Rudolf, 4,346,993, Cl. 356-138.000.
Rhodes, David B., to United States of America, National Aeronautics and Space Administration. Scanning afocal laser velocimeter projection lens system. 4,346,990, Cl. 356-28.500.
Rhone-Poulenc Industries: *See*—
Farge, Daniel; Le Roy, Pierre; Moutonnier, Claude; and Peyronel, Jean-Francois, 4,347,359, Cl. 544-182.000.
Rice, Hal H.; and Kruger, Gary A., to General Motors Corporation. Insulating engine exhaust port liner. 4,346,556, Cl. 60-272.000.
Rice, Lynn H., to UOP Inc. Isomerization of normal butane. 4,347,399, Cl. 585-738.000.
Richard, James A.: *See*—
Meyerhoff, Alfred; Kastovich, John C.; Richard, James A.; and Vales, Richard J., 4,346,845, Cl. 239-418.000.
Richards, David J., to Medishield Corporation Limited, The. Gas administration apparatus. 4,346,701, Cl. 128-200.140.
Richardson-Merrell Inc.: *See*—
Giroux, Eugene L., 4,347,255, Cl. 424-285.000.
Richburg, Ernest H., to United States of America, Army. Dual load point external load suspension implement. 4,346,862, Cl. 244-137.00R.
Ricoh Company, Ltd.: *See*—
Aizawa, Masahiro, 4,346,878, Cl. 271-118.000.
Ogawa, Mutsuo, 4,347,533, Cl. 358-296.000.
Rideout, Janet L.: *See*—
Krenitsky, Thomas A.; and Rideout, Janet L., 4,347,315, Cl. 435-87.000.
Riendl, Joseph A.: *See*—
Bagoy, John P.; and Riendl, Joseph A., 4,346,748, Cl. 152-222.000.
Rieter Machine Works Ltd.: *See*—
Demuth, Robert, 4,346,500, Cl. 19-105.000.
Righetti, Gianmaria. Apparatus and process for purifying polluted water contained in natural or artificial pools by direct injection of oxygen. 4,347,143, Cl. 210-758.000.
Rim, Yong S.: *See*—
Nudenberg, Walter; Rim, Yong S.; and Matthews, Demetreos N., 4,347,159, Cl. 252-429.00B.
Riniker, Bernhard: *See*—
Neher, Robert; and Riniker, Bernhard, 4,347,242, Cl. 424-177.000.
Rissi, Paul, to General Motors Corporation. Electromagnetic fuel injector with adjustable armature spring. 4,346,847, Cl. 239-585.000.
Rizos, Ioannis, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Hold down support system. 4,347,023, Cl. 410-32.000.
Robbins, Clayton B.: *See*—
Moore, Robert A.; Norlund, Bruce K.; Kontrovitz, Harold S.; Robbins, Clayton B.; and Brooks, Jeffrey B., 4,347,525, Cl. 346-153.100.
Robert, Bernard J.: *See*—
Lafosse, Jean R. M.; and Robert, Bernard J., 4,347,135, Cl. 210-208.000.
Robert Bosch GmbH: *See*—
Eblen, Ewald; and Hofmann, Karl, 4,346,846, Cl. 239-533.300.
Fischer, Hermann; Friese, Karl-Hermann; Gruber, Hans-Ulrich; Heinemann, Wolfgang; Knoll, Gunter; Linder, Ernst; Maurer, Helmut; Noack, Rainer; Steinke, Leo; Weber, Lothar; and Weyl, Helmut, 4,347,113, Cl. 204-195.00S.
Frister, Manfred; and Meyer, Friedhelm, 4,347,543, Cl. 361-91.000.
Kienzle, Wolfgang; Paschke, Werner; and Nagele, Erwin, 4,346,589, Cl. 73-118.000.
Latsch, Reinhard; and Bianchi, Valerio, 4,346,625, Cl. 74-859.000.
Leiber, Heinz, 4,346,942, Cl. 303-92.000.
Leiber, Heinz, 4,346,943, Cl. 303-119.000.
Leiber, Heinz, 4,346,944, Cl. 303-119.000.
Peters, Klaus-Jurgen; Krauss, Rudolf; and Binggeser, Ernst, 4,346,577, Cl. 72-129.000.
Schleicher, Rolf; Seebald, Lutz; and Seitz, Walter, 4,346,681, Cl. 123-179.00L.
Schrauf, Werner; Werner, Peter; Luetkens, Luer; Maue, Hans-Heinrich; and Suchowerskyj, Wadym, 4,346,913, Cl. 280-735.000.
Stumpp, Gerhard; and Wessel, Wolf, 4,346,727, Cl. 137-117.000.
Wenzel, Manfred, 4,347,626, Cl. 455-18.000.
Roberts, John S., to Kling-Tecs, Inc. Method of extruding polypropylene yarn. 4,347,206, Cl. 264-176.00F.

Roberts, John S., to Kling-Tecs, Inc. Method of extruding polypropylene yarn. 4,347,207, Cl. 264-176.00F.
Rockliff, Peter. Sensor detector element for an electrical hygrometer. 4,347,550, Cl. 361-286.000.
Rockwell International Corporation: *See—*
Abbott, Ned E.; Keshavan, Hampapur R.; and McGuire, Robert J., 4,347,600, Cl. 370-13.000.
Cumming, James C., 4,346,791, Cl. 188-71.500.
DeTar, George F., Jr.; Schaefer, Marcus J.; and Busby, William R., 4,347,567, Cl. 364-200.000.
Kalinsky, Wayne A., 4,347,558, Cl. 363-17.000.
Massie, Norbert A., 4,346,999, Cl. 356-349.000.
Tam, Matthias L., 4,347,476, Cl. 323-313.000.
Rodac Pneumatic Tools: *See—*
Hanson, Anthony, 4,346,630, Cl. 81-57.130.
Rodak, Edward, to General Defense Corporation. Method and apparatus for refuse disposal. 4,346,653, Cl. 100-37.000.
Rogers, John E., Jr. Method of forming contoured cushion. 4,347,213, Cl. 264-510.000.
Rogers, Kenneth H., to United States of America, Navy. Self-contained backflush/start system for suction LFC undersea vehicle. 4,346,662, Cl. 114-20.00R.
Rohco, Inc.: *See—*
Willis, William J., 4,347,108, Cl. 204-52.00R.
Rohner, Joachim; and Wey, Edmund, to W. Schlafhorst & Co. Device for removing dust from a winding machine. 4,346,497, Cl. 15-301.000.
RoJohn, D. Scott: *See—*
Dick, Donald E.; Metz, Robert L.; RoJohn, D. Scott; and Elliott, Raymond D., 4,346,867, Cl. 248-424.000.
Roller, George J.; and Schell, Richard P., to Xerox Corporation. Apparatus for inverting substrates. 4,346,880, Cl. 271-186.000.
Rolls-Royce Limited: *See—*
Midgley, Ronald A., 4,346,786, Cl. 184-6.200.
Romig, Charles A.: *See—*
Homan, Gary R.; and Romig, Charles A., 4,347,336, Cl. 524-731.000.
Ronning Engineering Company Inc.: *See—*
Ronning, Richard L., 4,346,523, Cl. 34-17.000.
Ronning, Richard L., to Ronning Engineering Company Inc. Method and apparatus for recovering heat in product dehydration system. 4,346,523, Cl. 34-17.000.
Rood, Alvin A., to Nordson Corporation. Airless spray nozzle and method of making it. 4,346,849, Cl. 239-597.000.
Rosaen, Nils O. Fluid flow meter with improved sealing means. 4,346,607, Cl. 73-861.750.
Rosemount Engineering Company Limited: *See—*
Hunter, Donald N.; and Brook, Richard J., 4,347,495, Cl. 338-34.000.
Rosen, Robert A.; Schuchmann, Gayle F.; and Pate, James E., to Puro Corporation. Float controlled liquid dispenser. 4,346,483, Cl. 4-227.000.
Rosenhagen, William: *See—*
Zeno, John R.; and Rosenhagen, William, 4,346,640, Cl. 84-464.00R.
Ross, Frederick W. Impact device with sinusoidal rotary-to-reciprocative converter. 4,346,768, Cl. 173-118.000.
Rossi, Joe. Rototiller with angularly disposed teeth. 4,346,764, Cl. 172-42.000.
Rothberg, Michael R. Process for removal of radioactive materials from aqueous solutions. 4,347,141, Cl. 210-721.000.
Rowenta-Werke GmbH: *See—*
Conrad, Rainer; and Seifert, Hubert, 4,347,428, Cl. 219-251.000.
Ruenzi, Kurt. Sheet separating device for office machines. 4,346,879, Cl. 271-121.000.
Ruggeri, Mariano: *See—*
Cron, Martin J.; Keil, John G.; Lin, Jeng S.; Ruggeri, Mariano; and Walker, Derek, 4,347,354, Cl. 536-10.000.
Russell, Leonard V.; and Beaney, Derek N., to Universal Materials Company Limited. Portable golf practice mat. 4,346,896, Cl. 273-195.00A.
Rutherford, William, to Hunter Wire Products Limited. Screening module. 4,347,129, Cl. 209-399.000.
Rutkowski, Stephen L.: *See—*
Kavouras, Stephen P.; Post, Paul C.; Wells, Roderick A.; and Rutkowski, Stephen L., 4,347,618, Cl. 375-37.000.
Rutsch, Peter: *See—*
Weber, Kurt; Rutsch, Peter; and Hirschinger, Lothar, 4,347,276, Cl. 428-160.000.
Ruvoen, Michel: *See—*
Jacob, Jean-Baptiste; Mathieu, Yves; and Ruvoen, Michel, 4,347,603, Cl. 370-85.000.
Rypkema, Jouke N.: *See—*
Flasza, Michael D.; and Rypkema, Jouke N., 4,347,483, Cl. 331-12.000.
S. C. Johnson & Son, Inc.: *See—*
Lohr, Robert H.; and Morgan, Lee W., 4,347,151, Cl. 252-163.000.
Lohr, Robert H.; and Morgan, Lee W., 4,347,333, Cl. 524-269.000.
S.R.M. Hydromekanik Aktiebolag: *See—*
Ahlen, Karl G.; and Norberg, Nils A., 4,347,044, Cl. 417-253.000.
Sabbatis, Raymond E.: *See—*
Krauss, Ferdinand A.; Ganyard, Ivan S.; and Sabbatis, Raymond E., 4,346,635, Cl. 83-479.000.
Saft-Societe des Accumulateurs Fixes et de Traction: *See—*
Bernard, Alain; and Bonnaterre, Raymond, 4,347,292, Cl. 429-65.000.
Sagawa, Masato; and Yamagishi, Wataru, to Fujitsu Limited. Process and apparatus for producing a temperature sensitive element. 4,347,201, Cl. 264-24.000.
Saint-Gobain Industries: *See—*
Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, 4,347,070, Cl. 65-9.000.
Saito, Kenji; and Yamachika, Hiroshi, to Sumitomo Chemical Company, Limited. Process for preparing cyclopentenolones. 4,347,386, Cl. 568-310.000.
Saito, Masaki; and Kanazashi, Tetuo, to Pioneer Electronic Corporation. Bi-directional data communications system. 4,347,604, Cl. 370-85.000.
Saito, Masatsugu: *See—*
Abe, Kunio; Saito, Masatsugu; Ono, Masao; and Ikedo, Yuji, 4,347,596, Cl. 369-72.000.
Saito, Toshihisa; and Inoue, Nobuyoshi, to Copal Company Limited. Light leakage preventing device for reflex cameras. 4,346,974, Cl. 354-154.000.
Saiya, Robert F. Headset cable strain relief clamp. 4,346,501, Cl. 24-329.000.
Saji, Yasuo; Tanaka, Kozo; and Yamauchi, Takashi, to Toho Beslon Co., Ltd. High performance carbon fiber, process for production thereof, and composite materials prepared therewith. 4,347,279, Cl. 428-294.000.
Sakaguchi, Shuzabu: *See—*
Isshiki, Tomiya; Tomita, Tetsuo; Sakaguchi, Shuzabu; Kohzaki, Toshiaki; Aoki, Osamu; Takeda, Norio; and Aoki, Yoshiyuki, 4,347,383, Cl. 564-249.000.
Sakai, Shinji: *See—*
Kawabata, Takashi; Tsunekawa, Tokuichi; Hosoe, Kazuya; Kinoshita, Takao; Sakai, Shinji; and Taguchi, Tatsuya, 4,346,970, Cl. 354-25.000.
Sakamoto, Masaaki; and Takeuchi, Shinji, to Kabushiki Kaisha Komatsu Seisakusho. Speed control apparatus for a vehicle. 4,346,618, Cl. 74-491.000.
Sakamoto, Masafumi, to Japan Servo Co. Permanent magnet type stepping motor. 4,347,457, Cl. 310-256.000.
Sakurai, Hideki; Nakatani, Mitsuo; Oka, Hitoshi; Yokono, Hitoshi; and Isogai, Tokio, to Hitachi, Ltd. Process for forming metallic image. 4,347,304, Cl. 430-291.000.
Salzgitter Maschinen und Anlagen Aktiengesellschaft: *See—*
Manten, Heinrich, 4,346,766, Cl. 173-23.000.
Sanders Associates, Inc.: *See—*
Schwartz, Jacob, 4,346,992, Cl. 356-73.000.
Sanderson, George R.: *See—*
Challen, Ian A.; East, Sandra; and Sanderson, George R., 4,347,261, Cl. 426-573.000.
Sandland, Paul: *See—*
Levy, Kenneth; and Sandland, Paul, 4,347,001, Cl. 356-398.000.
Sando Iron Works Co., Ltd.: *See—*
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,346,503, Cl. 28-155.000.
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Process for de-twisting and craping a cloth composed of twisted yarns. 4,346,503, Cl. 28-155.000.
Sandoz Ltd.: *See—*
Harr, Jost, 4,347,253, Cl. 424-272.000.
Sangamo Weston, Inc.: *See—*
Gurr, George P.; Davis, John N.; and Wiggins, E. Thomas, 4,347,575, Cl. 364-492.000.
Sannomiya, Shigehiro: *See—*
Nagasaki, Michisuke; and Sannomiya, Shigehiro, 4,346,624, Cl. 74-784.000.
Sano, Konosuke: *See—*
Miwa, Kiyoshi; Tsuchida, Takayasu; Kurahashi, Osamu; Nakamori, Shigeru; Sano, Konosuke; and Momose, Haruo, 4,347,318, Cl. 435-115.000.
Sano, Shoichi: *See—*
Osada, Isao; and Sano, Shoichi, 4,346,747, Cl. 152-158.000.
Santen Pharmaceutical Co., Ltd.: *See—*
Iwao, Jun-ichi; Oya, Masayuki; and Iso, Tadashi, 4,347,371, Cl. 548-201.000.
Santoro, Joseph F.: *See—*
Jeromin, Lothar S.; Geddes, Glenn F.; Baumann, Otto S.; and Santoro, Joseph F., 4,346,983, Cl. 355-3.00R.
Sara, Raymond V., to Union Carbide Corporation. Chemically bonded aluminum coating for carbon via monocarbides. 4,347,083, Cl. 75-204.000.
Sarid, Dror: *See—*
Sprague, Robert A.; and Sarid, Dror, 4,346,965, Cl. 350-358.000.
Saron, John R. Flexible light with protective cap. 4,347,553, Cl. 362-189.000.
Sato, Atsushi; Takahashi, Naoya; Endo, Keiji; and Yanagishita, Hitoshi, to Nippon Petrochemicals Company, Limited. Electrical insulating oil and oil-filled electrical appliances. 4,347,169, Cl. 252-567.000.
Sato, Fumitaka: *See—*
Koda, Akira; Sato, Fumitaka; and N[illegible]ibe, Shinji, 4,347,566, Cl. 364-200.000.
Sato, Hajime; Morisue, Tetsuo; and Heki, Hideaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Failed fuel detection and location apparatus. 4,347,214, Cl. 376-251.000.
Sato, Shigeru: *See—*
Inagaki, Masao; and Sato, Shigeru, 4,346,837, Cl. 236-34.500.
Saunders, William T., to National Steel Corporation. Manufacture of lightweight drawn and ironed can bodies. 4,346,580, Cl. 72-344.000.

Sawae, Kiyoshi: *See*—
Inohara, Akio; Sawae, Kiyoshi; Kawaguchi, Hisao; and Fujimoto, Takeo, 4,347,074, Cl. 65-32.000.
Sawafuji Denki Kabushiki Kaisha: *See*—
Yoneda, Tadao; and Tsunoda, Michinori, 4,346,615, Cl. 74-7.00A.
Sawara Mfg. Works Co., Ltd.: *See*—
Watanabe, Shinichiro, 4,347,094, Cl. 156-387.000.
Scarton, Henry A.; Kennedy, Warren C.; Gaylo, Keith R.; and Caplan, Clark R., to Rensselaer Polytechnic Institute. Apparatus for treating flowing working gases particularly to reduce the noise in operation thereof. 4,346,783, Cl. 181-230.000.
Scemama, Patrick: *See*—
Bayen, Jean; and Scemama, Patrick, 4,346,726, Cl. 137-15.000.
Schaefer, John O., to International Business Machines Corporation. Typewriter cartridge and feed mechanism therefor. 4,347,007, Cl. 400-208.000.
Schaefer, Marcus J.: *See*—
DeTar, George F., Jr.; Schaefer, Marcus J.; and Busby, William R., 4,347,567, Cl. 364-200.000.
Schafer, Albert L.: *See*—
Miller, Benjamin D.; and Schafer, Albert L., 4,346,824, Cl. 222-504.000.
Schafer, David E.: *See*—
D'Amico, John J.; and Schafer, David E., 4,347,366, Cl. 546-261.000.
Scharver, Jeffrey D., to Burroughs Wellcome Co. 3^H Labeled compounds. 4,347,382, Cl. 564-183.000.
Schauer, Henry: *See*—
Latimer, John P.; Donaldson, Robert; Cross, Michael; MacPhaiden, Harold; Skiles, Loren D.; Schauer, Henry; and Reynolds, Thomas J., 4,347,029, Cl. 414-22.000.
Scheingold, William S.: *See*—
Bright, Edward J.; Kaplon, David A.; and Scheingold, William S., 4,346,952, Cl. 339-17.0CF.
Schelhas, Peter; and Schlott, Walter, to Atlantic Richfield Company. Retaining means. 4,347,026, Cl. 411-299.000.
Schell, Richard P.: *See*—
Roller, George J.; and Schell, Richard P., 4,346,880, Cl. 271-186.000.
Schering Corporation: *See*—
Afonso, Adriano; and Hon, Frank, 4,347,183, Cl. 260-245.20R.
Scherzer, Julius, to Filtrol Corporation. Mono- and poly-metallic supported catalysts. 4,347,164, Cl. 252-455.00Z.
Scheurer, Guenther: *See*—
Merkenich, Karl; Koch, Wilhelm; Glandorf, Kaete; Uhlmann, Gerd; and Scheurer, Guenther, 4,347,258, Cl. 426-334.000.
Schickedanz, Willi. Toaster for bread and other food items. 4,346,651, Cl. 99-392.000.
Schiller, Gerald J.: *See*—
Merian, Jacques S.; and Schiller, Gerald J., 4,347,173, Cl. 524-88.000.
Schindler, John K., to United States of America, Air Force. Netted search radar system. 4,347,513, Cl. 343-18.00E.
Schleicher, Rolf; Seebald, Lutz; and Seitz, Walter, to Robert Bosch GmbH. Apparatus for fuel metering, and in particular, supplementary fuel metering, by means of a special metering device in an externally ignited internal combustion engine. 4,346,681, Cl. 123-179.00L.
Schlott, Walter: *See*—
Schelhas, Peter; and Schlott, Walter, 4,347,026, Cl. 411-299.000.
Schmid, Carl E., to Perkin-Elmer Corporation, The. Microflow transducer. 4,346,603, Cl. 73-861.050.
Schmid, Josef; Lange, Ludwig; Klebe, Hans; and Schutte, Dieter, to Degussa Aktiengesellschaft. Process for the pyrogenic production of finely divided oxide of a metal and/or a metalloid. 4,347,229, Cl. 423-336.000.
Schmid, Klaus: *See*—
Wagner, Gerard; and Schmid, Klaus, 4,346,693, Cl. 126-434.000.
Schmidt, Alfred, to Alfred Schmidt, GmbH. Snow removal apparatus. 4,346,527, Cl. 37-250.000.
Schmidt, Donald H. Flexible composition of cork and sheet structures made therefrom. 4,347,272, Cl. 428-40.000.
Schmidt, Hans, to TE KA DE Felten & Guilleaume Fernmeldeanlagen GmbH. Method and system for processing coded information transmitted during cyclically successive time frames. 4,347,601, Cl. 370-58.000.
Schmidt, Paul F.: *See*—
Pearce, Charles W.; and Schmidt, Paul F., 4,347,431, Cl. 219-390.000.
Schmitt, Edward E., to ALZA Corporation. Drug delivery devices comprising erodible polymer and erosion rate modifier. 4,346,709, Cl. 128-260.000.
Schmitt, Robert F., to G & S Company. Building panel construction and panel assemblies utilizing same. 4,346,541, Cl. 52-309.110.
Schmitt, Susan M.: *See*—
Christensen, Burton G.; Johnston, David B. R.; and Schmitt, Susan M., 4,347,367, Cl. 546-272.000.
Christensen, Burton G.; Johnston, David B. R.; and Schmitt, Susan M., 4,347,368, Cl. 546-272.000.
Schmitz, Hans H., to MEDAC Gesellschaft fur Klinishce Spezialpraparate mbH. Enzyme immunosassay for determining antigen specific antibodies and test kit for carrying out this assay. 4,347,311, Cl. 435-5.000.
Schneider, Morris D., to Research Corporation. Acid soluble, pepsin resistant platelet aggregating material. 4,347,243, Cl. 424-177.000.
Schneider, Rudolf, to Erowa AG. Process and apparatus for controlling the electrode on a spark erosion machine. 4,347,422, Cl. 219-69.00M.
Schoenig, Frederick C., Jr.: *See*—
Bernatowicz, Henry; and Schoenig, Frederick C., Jr., 4,347,622, Cl. 376-245.000.
Schoettle, Klaus; Dobler, Peter; Gliniorz, Lothar; and Hoffmann, Werner, to BASF Aktiengesellschaft. Tape cartridge assembly and tape transport apparatus for use therewith. 4,347,537, Cl. 360-132.000.
Schomer, Paul D.; and Hunt, Alan B. Microphone droop and sensitivity measurement device. 4,347,410, Cl. 179-175.10A.
Schorscher, John J., to Tip Top Remaco Ltd. Portable tire repair apparatus. 4,347,096, Cl. 156-583.300.
Schrauf, Werner; Werner, Peter; Luetkens, Luer; Maue, Hans-Heinrich; and Suchowerskyj, Wadym, to Robert Bosch GmbH. False release registering circuit for collision protective devices. 4,346,913, Cl. 280-735.000.
Schregenberger, Alex J., to Midland-Ross Co. Apparatus used in the treatment of cans. 4,346,722, Cl. 134-62.000.
Schrewe, Hans: *See*—
Mezger, Sepp; Lerch, Kurt; Schrewe, Hans; and Pleschiutschnigg, Fritz-Peter, 4,346,724, Cl. 134-122.00R.
Schroeder, Philip W.; and Lindstrom, Edgar K., to J. I. Case Company. Ground drive control. 4,346,617, Cl. 74-481.000.
Schuchmann, Gayle F.: *See*—
Rosen, Robert A.; Schuchmann, Gayle F.; and Pate, James E., 4,346,483, Cl. 4-227.000.
Schuessler, Thomas F.: *See*—
Agdanowski, Ronald T.; and Schuessler, Thomas F., 4,346,711, Cl. 128-276.000.
Schumacher, Ignatius; and Wang, Kang-bo, to Monsanto Company. Vapor phase nitration of aromatic compounds. 4,347,389, Cl. 568-937.000.
Schurter, Rolf: *See*—
Lukaszczyk, Alfons; Martin, Henry; Diel, Peter J.; Fory, Werner; Gatzi, Karl; Kristinsson, Haukur; Muller, Beat; Muntwyler, Rene; Pachlatko, Johannes P.; Rempfler, Hermann; Schurter, Rolf; and Szczepanski, Henry, 4,347,372, Cl. 548-217.000.
Schuster, Klaus: *See*—
Bartl, Herbert; and Schuster, Klaus, 4,347,341, Cl. 525-267.000.
Schutrum, Walter L.: *See*—
Bahl, Surinder K.; and Schutrum, Walter L., 4,347,522, Cl. 346-75.000.
Schutte, Dieter: *See*—
Schmid, Josef; Lange, Ludwig; Klebe, Hans; and Schutte, Dieter, 4,347,229, Cl. 423-336.000.
Schwaab, Manfred; Puschnerat, Helmut; and Storz, Kurt, to Albert-Frankenthal, AG. Device for making printed matter with changing imprints. 4,346,656, Cl. 101-181.000.
Schwager, Joseph E.; and Urban, Harry E., to United States of America, Navy. Electrical waveform synthesizer. 4,347,403, Cl. 179-1.0SA.
Schwartz, Ira, to Conshohocken Cotton Co., Inc. Helically wrapped yarn. 4,346,553, Cl. 57-210.000.
Schwartz, Jacob, to Sanders Associates, Inc. Laser detector and spectral analyzer. 4,346,992, Cl. 356-73.000.
Scifres, Donald R.; Burnham, Robert D.; and Streifer, William, to Xerox Corporation. Large optical cavity (LOC) mesa laser. 4,347,611, Cl. 372-45.000.
Scifres, Donald R.: *See*—
Fekete, Dan H.; Scifres, Donald R.; and Streifer, William, 4,347,612, Cl. 372-50.000.
SCM Corporation: *See*—
Joyce, Edward R.; and Smith, William L., 4,347,110, Cl. 204-149.000.
Scoggin, Jack S., to Phillips Petroleum Company. Process for the separation of sulfur compounds from water. 4,347,385, Cl. 568-72.000.
Scranton, Robert A., to International Business Machines Corporation. Neel wall segment detection in cross-tie memory systems. 4,347,583, Cl. 365-87.000.
Scranton, Robert J.: *See*—
Paranjpe, Suresh C.; Davis, James W.; Scranton, Robert J.; and Wells, Roger D., 4,347,520, Cl. 346-75.000.
Scribani, Anthony A.: *See*—
Limoges, Raymond F.; Scribani, Anthony A.; and Wilson, Robert J., 4,347,307, Cl. 430-338.000.
Sears, Roebuck and Company: *See*—
Singletary, Buckley A.; and Gall, John C., 4,346,749, Cl. 160-301.000.
Seaton, William W.: *See*—
Dunville, Dennis L.; Seaton, William W.; and Good, Charles H., 4,346,799, Cl. 198-367.000.
Seebald, Lutz: *See*—
Schleicher, Rolf; Seebald, Lutz; and Seitz, Walter, 4,346,681, Cl. 123-179.00L.
Segawa, Yoshihiro: *See*—
Yasuda, Eturo; Segawa, Yoshihiro; and Ohta, Minoru, 4,346,585, Cl. 73-23.000.
Seiersen, Ole S., to Christian Rovsing A/S. Square wave generator. 4,347,560, Cl. 363-24.000.
Seifert, Hubert: *See*—
Conrad, Rainer; and Seifert, Hubert, 4,347,428, Cl. 219-251.000.
Seitz, Walter: *See*—
Schleicher, Rolf; Seebald, Lutz; and Seitz, Walter, 4,346,681, Cl. 123-179.00L.
Seitz, William R.: *See*—
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Sekiguchi, Tetsuo: *See*—
Komoto, Shinsuke; and Sekiguchi, Tetsuo, 4,346,967, Cl. 350-430.000.
Sekine, Kenji: *See*—
Hirota, Yukitsugu; Endo, Akira; Kimura, Katsuhiro; Morozumi, Hiroshi; and Sekine, Kenji, 4,346,774, Cl. 180-167.000.
Sekine, Masaru: *See*—
Fuse, Takeshi; and Sekine, Masaru, 4,346,793, Cl. 188-134.000.
Self, James M., to Tanner Chemical Company, Inc. Foamed, low density, highly extended unsaturated polyester resin syrup composition, a shaped article comprised of the composition and a process for preparing such article. 4,347,331, Cl. 521-119.000.
Seligco Food Corporation: *See*—
Raymor, Roger F.; and Adams, Les, 4,346,815, Cl. 220-306.000.
Semanisin, Dale J.: *See*—
Slama, William R.; Washburn, Robert B.; and Semanisin, Dale J., 4,347,277, Cl. 428-215.000.
Senga, Taizo: *See*—
Nakamura, Yoshiyuki; Matsubara, Seiichi; Matsui, Takashi; Kumagai, Taiji; Senga, Taizo; and Fukutsu, Tsutomu, 4,347,614, Cl. 373-77.000.
Sep, Waltherus J.; and Huijsman, Adam, to Internationale Octrooi Maatschappij "Octropa" B.V. Unsaturated polyester compositions and their use. 4,347,170, Cl. 523-511.000.
Shadman, Farhang; and Hegedus, Louis, to General Motors Corporation. Incineration-cleanable composite diesel exhaust filter and vehicle equipped therewith. 4,346,557, Cl. 60-311.000.
Shakib, Iraj D., to International Business Machines Corporation. Paper insert and line feed mechanism. 4,347,006, Cl. 400-187.000.
Shannon, Richard F., to Owens-Corning Fiberglas Corporation. Fibrous product. 4,347,271, Cl. 428-36.000.
Shapiro, German. Spironolactone-containing composition and use thereof. 4,347,245, Cl. 424-241.000.
Sharp Kabushiki Kaisha: *See*—
Inohara, Akio; Sawae, Kiyoshi; Kawaguchi, Hisao; and Fujimoto, Takeo, 4,347,074, Cl. 65-32.000.
Washo, Junichi, 4,347,265, Cl. 427-108.000.
Sharpee, Richard L.: *See*—
Bass, Edmund P.; and Sharpee, Richard L., 4,347,239, Cl. 424-89.000.
Shaw, Leon L. Tricycle canopy. 4,346,725, Cl. 135-7.000.
Shaw, Wilfrid G.; and Paparizos, Christos, to Standard Oil Company. Te-containing methacrolein oxidation catalysts and their use. 4,347,163, Cl. 252-435.000.
Shelton, Oscar A., to Moore Business Forms, Inc. Multiple ply business form and manifold assembly. 4,346,916, Cl. 282-11.50A.
Sherwood Medical Industries Inc.: *See*—
Agdanowski, Ronald T.; and Schuessler, Thomas F., 4,346,711, Cl. 128-276.000.
Sherwood, Rexford D.; Baker, Rees T. K.; Derouane, Eric G.; and Pieters, Wim J., to Exxon Research & Engineering Co. Process for catalytically gasifying carbon. 4,347,063, Cl. 48-197.00R.
Shiba, Keisuke; and Toyama, Tadao, to Fuji Photo Film Co., Ltd. Photosensitive lithographic printing plate precursors and methods of preparing printing plate therefrom. 4,347,305, Cl. 430-302.000.
Shibahara, Takashi; Kohno, Teruo; and Misaka, Yoshisuke, to Sumitomo Metal Industries, Ltd. Method of width control in hot strip mill. 4,346,575, Cl. 72-16.000.
Shibatani, Kyoichiro: *See*—
Nagase, Yoshinori; Shibatani, Kyoichiro; Yamauchi, Junichi; and Omura, Ikuo, 4,347,174, Cl. 523-116.000.
Yamauchi, Junichi; Shibatani, Kyoichiro; Ikeguchi, Eiji; Omura, Ikuo; and Nagase, Yoshinori, 4,347,233, Cl. 424-7.000.
Shibuya, Tadao: *See*—
Murofushi, Satoru; Shibuya, Tadao; Kato, Shinichi; and Endo, Mitsuo, 4,347,504, Cl. 340-638.000.
Shiga, Tetsuo; Ozaki, Masaru; Arakawa, Tatsumi; Kimura, Takeo; and Kobayashi, Hidehiko, to Asahi Kasei Kogyo Kabushiki Kaisha. Heat developable silver image forming materials. 4,347,310, Cl. 430-620.000.
Shigehara, Itaru: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; Shigehara, Itaru; Nagatani, Kuniaki; and Nishimura, Shigeyuki, 4,347,390, Cl. 570-202.000.
Shim, Norm: *See*—
Pekkarinen, Michael O.; and Shim, Norm, 4,346,705, Cl. 128-214.00F.
Shima, Kazumi: *See*—
Zamma, Jun; Makino, Isao; Mii, Toshiyuki; and Shima, Kazumi, 4,347,221, Cl. 422-207.000.
Shimamura, Masaharu: *See*—
Yoshioka, Toshio; Teramoto, Kazuo; and Shimamura, Masaharu, 4,347,316, Cl. 435-94.000.
Shimazu, Ken-Ichi; and Nakayama, Takao, to Polychrome Corporation. Imaging peel apart element employing two photohardenable layers. 4,347,300, Cl. 430-156.000.
Shimbo, Masafumi: *See*—
Nishizawa, Junichi; and Shimbo, Masafumi, 4,346,513, Cl. 29-580.000.
Shimizu, Kazuyuki: *See*—
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Shimizu, Masao: *See*—
Suzuki, Yoshio; and Shimizu, Masao, 4,347,259, Cl. 426-465.000.
Shimoiizaka, Junzo; and Fujita, Toyohisa, to Nittetsu Mining Co., Ltd. Method and device of separating materials of different density by ferromagnetic liquid. 4,347,124, Cl. 209-1.000.
Shimomura, Hiromi: *See*—
Katsube, Junki; Shimomura, Hiromi; Inokuma, Shun; and Sugie, Akihiko, 4,347,254, Cl. 424-275.000.
Shinagawa Machinery Works Co., Ltd.: *See*—
Zaitsu, Eizo, 4,346,650, Cl. 99-361.000.
Shinbori, Kenichi: *See*—
Katsuma, Makoto; Suzuki, Masayuki; Shinbori, Kenichi; and Murakami, Hiroyasu, 4,346,973, Cl. 354-152.000.
Shingu, Tetsuro: *See*—
Touyama, Ryousuke; Inouye, Hiroyuki; Shingu, Tetsuro; Takeda, Yoshio; Ikumoto, Takeshi; Okuyama, Hidetoshi; and Yamamoto, Osamu, 4,347,356, Cl. 542-430.000.
Shinoi, Tsuyoshi: *See*—
Ogawa, Seiki; Mito, Michio; and Shinoi, Tsuyoshi, 4,347,409, Cl. 179-99.00P.
Shiozawa, Shookichi; Nakayama, Tomomi; Haga, Kyosuke; Abe, Ryutaro; and Takeuchi, Yoshiyuki, to Toyoda Koki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Hydraulic pump for power steering. 4,347,047, Cl. 417-310.000.
Shmagina, Nina N.: *See*—
Chernikhov, Alexei Y.; Yakovlev, Mikhail N.; Lysova, Valentina B.; Gefter, Evgeny L.; and Shmagina, Nina N., 4,347,348, Cl. 528-51.000.
Shook, Howard E., Jr., to Du Pont de Nemours, E. I., and Company. Aryl borane complexes. 4,347,193, Cl. 260-439.00R.
Shrekenhamer, Abraham, to Singer Company, The. Rectangular beam shaping antenna employing microstrip radiators. 4,347,516, Cl. 343-700.0MS.
Shugart Associates: *See*—
Dalziel, Warren L., 4,347,535, Cl. 360-99.000.
Shung, Wu S., to Otis Elevator Company. Tailorable discrete optical sensor. 4,346,788, Cl. 187-29.00R.
Shuster, Frank A.: *See*—
Kroll, Arthur S.; and Shuster, Frank A., 4,347,298, Cl. 430-97.000.
Shustova, Olga A.; Gladyshev, Georgy P.; and Potapova, Tamara P. Method for stabilization of polymers. 4,347,175, Cl. 523-455.000.
Shute, Bruce W.: *See*—
Allen, John J., Jr.; and Shute, Bruce W., 4,347,569, Cl. 364-426.000.
Shwayder, Warren M. Skid shoe for snow plow blade. 4,346,528, Cl. 37-270.000.
Siemens Aktiengesellschaft: *See*—
Gellert, Klaus; Nagel, Gunter; and Pollmeier, Franz J., 4,347,454, Cl. 310-193.000.
Haerten, Rainer, 4,346,717, Cl. 128-660.000.
Hoffmann, Kurt; and Zapf, Karl J., 4,347,588, Cl. 365-206.000.
Kobale, Manfred; and Krueger, Hans, 4,346,963, Cl. 350-344.000.
Tschunt, Edgar, 4,347,624, Cl. 378-10.000.
Siemens Corporation: *See*—
Frank, Reinhard, 4,347,582, Cl. 364-900.000.
Siemens Medical Laboratories, Inc.: *See*—
Gibson, Robert, 4,347,547, Cl. 361-187.000.
Haas, Werner, 4,347,440, Cl. 378-156.000.
Siemionko, Roger K., to Du Pont de Nemours, E. I., and Company. Aromatic polyester and filaments. 4,347,349, Cl. 528-190.000.
Sifford, Perry P.: *See*—
Jones, John C.; Sifford, Perry P.; and Sutton, Joel F., 4,347,040, Cl. 416-190.000.
Sigma-Tau Industrie Farmaceutiche Riunite: *See*—
Cavazza, Claudio, 4,346,820, Cl. 222-83.000.
Sigworth, Harry W., Jr., to Chevron Research Company. Buoyant element check valve for a thermosiphon energy system. 4,346,731, Cl. 137-433.000.
Silchor: *See*—
Reed, Stewart D.; Sills, Arthur A.; Kraft, John H.; Houle, Raymond T.; Redwine, Michael A.; and Kilbourn, Frederick A., 4,346,485, Cl. 4-555.000.
Sills, Arthur A.: *See*—
Reed, Stewart D.; Sills, Arthur A.; Kraft, John H.; Houle, Raymond T.; Redwine, Michael A.; and Kilbourn, Frederick A., 4,346,485, Cl. 4-555.000.
Simmons, Robert W., to Dow Chemical Company, The. Methylene chloride stabilizer formulation for use in aerosols. 4,347,154, Cl. 252-305.000.
Simpson, Frank F., to Black & Decker Inc. Percussive tool drive linkage. 4,346,769, Cl. 173-118.000.
Sindelar, Robert A.; and Alexander, Donald J. Method and apparatus for asphalt paving. 4,347,016, Cl. 404-95.000.
Singer Company, The: *See*—
Ferriss, Lincoln S., 4,347,480, Cl. 328-55.000.
Friedland, Bernard, 4,347,573, Cl. 364-453.000.
Geiger, Robert J., 4,347,055, Cl. 434-30.000.
Shrekenhamer, Abraham, 4,347,516, Cl. 343-700.0MS.
Singh, Baldev, to Sterling Drug Inc. Process for preparing 1,2-dihydro-6-methyl-2-oxo-5-(pyridinyl)nicotinonitriles. 4,347,363, Cl. 546-249.000.
Singletary, Buckley A.; and Gall, John C., to Sears, Roebuck and Company. Motor and roller support for window shades and the like. 4,346,749, Cl. 160-301.000.
SISA, Incorporated: *See*—
Quick, James E.; Razdan, Raj K.; and Dalzell, Haldean C., 4,347,361, Cl. 546-45.000.
Sisak, Harry A. Board game apparatus. 4,346,897, Cl. 273-271.000.

Sisti, Giorgio; Tosi, Bruno; and Trestianu, Sorin, to Carlo Erba Strumentazione S.p.A. Device for the automation of at least one operation in an injector for gas chromatographic columns. 4,347,215, Cl. 422-63.000.
Sivachenko, Eugene W. Apparatus for severing corrugated metal products. 4,346,576, Cl. 72-49.000.
Skiles, Jerry W.: *See—*
Suh, John T.; Williams, Bruce E.; Skiles, Jerry W.; and Loev, Bernard, 4,347,246, Cl. 424-246.000.
Skiles, Loren D.: *See—*
Latimer, John P.; Donaldson, Robert; Cross, Michael; MacPhaiden, Harold; Skiles, Loren D.; Schauer, Henry; and Reynolds, Thomas J., 4,347,029, Cl. 414-22.000.
Skinner, Neal G.; and Braswell, Harry A., to Halliburton Company. Hydra-jet slotting tool. 4,346,761, Cl. 166-206.000.
Skladzien, Stanley B.; and Raue, Donald J., to United States of America, Energy. Magnetic flowmeter for electrically conductive liquid. 4,346,605, Cl. 73-861.130.
Slama, William R.; Washburn, Robert B.; and Semanisin, Dale J., to General Signal Corporation. Corrosion resistant coated articles which include an intermediate coating layer of a thermosetting polymer and non-siliceous filler. 4,347,277, Cl. 428-215.000.
Slater, Billy R.: *See—*
Paredes, Candelario; and Slater, Billy R., 4,347,563, Cl. 364-137.000.
Slivar, Djuro: *See—*
Haessler, Wolfgang; and Slivar, Djuro, 4,346,803, Cl. 198-813.000.
Smale, Terence C., to Beecham Group Limited. Intermediates for producing bicyclic β-lactam-antibiotics. 4,347,181, Cl. 260-245.20T.
Smejkal, George: *See—*
Markus, Lawrence W.; Smejkal, George; and Lace, Melvin A., 4,346,854, Cl. 242-67.10R.
Smeltzer, Paul, to Maremont Corporation. Shock absorber with improved back check and anti-dump valve mechanisms. 4,346,794, Cl. 188-322.140.
Smetanick, Andrew, to Freeport Transport, Inc. Tank trailer. 4,346,905, Cl. 280-5.00C.
Smilgys, Bruno S.: *See—*
Evans, Alfred C.; and Smilgys, Bruno S., 4,347,435, Cl. 235-94.00R.
Smirmaul, Heinz J.: *See—*
Tennant, Jerald L.; and Smirmaul, Heinz J., 4,346,482, Cl. 3-13.000.
Smith, Donald A.: *See—*
Gentilo, Dennis R.; Smith, Donald A.; and Pifer, David L., 4,347,427, Cl. 219-137.800.
Smith, Eileen; Timperley, Doreen A.; and Titchener, Dorothy M., to Interox Chemicals Limited. Aqueous bleach compositions. 4,347,149, Cl. 252-102.000.
Smith International, Inc.: *See—*
Dailey, Patrick E., 4,346,920, Cl. 285-89.000.
Morrill, Charles D., 4,346,919, Cl. 285-25.000.
Smith, Joseph E., to Gulf & Western Manufacturing Company. Hemispherical ball and socket joint. 4,347,014, Cl. 403-36.000.
Smith Kline & French Laboratories Limited: *See—*
Cooper, John; and Lee, Dennis V., 4,347,191, Cl. 549-492.000.
Durant, Graham J.; Ganellin, Charon R.; Owen, Geoffrey R.; and Young, Rodney C., 4,347,250, Cl. 424-263.000.
Smith & Nephew Associated Companies Limited: *See—*
Hollingsbee, Derek A., 4,347,238, Cl. 424-81.000.
Smith, Rory J. M.: *See—*
Murphy, Alan P.; Smith, Rory J. M.; and Brooks, Maxim C., 4,347,168, Cl. 252-547.000.
Smith, Verity C.; Baker, Robert J.; Barrow, Wyile W., Jr.; and Doane, H. Daniel, to Vaponics Inc. Apparatus for joining tubing. 4,346,923, Cl. 285-340.000.
Smith, William L.: *See—*
Joyce, Edward R.; and Smith, William L., 4,347,110, Cl. 204-149.000.
Sniader, David H. Heat pump control valve. 4,346,567, Cl. 62-160.000.
Snook, Richard K.: *See—*
Childs, William C., deceased; Snook, Richard K.; and Lester, Douglas R., 4,346,604, Cl. 73-861.120.
Socapex: *See—*
Chesnais, Andre; and Thiery, Philippe, 4,346,955, Cl. 339-97.00R.
Societa Italiana Catene Calibrate Regina S.p.A.: *See—*
Restelli, Amedeo A., 4,346,777, Cl. 180-220.000.
Societe Anonyme dite: Institut Merieux: *See—*
Mynard, Marie-Claude; and Tayot, Jean-Louis, 4,347,244, Cl. 424-180.000.
Societe Grenobloise d'Etudes et d'Applications Hydrauliques (SOGREAH): *See—*
Chevallier, Arnauld, 4,347,017, Cl. 405-29.000.
Societe Nationale des Poudres et Explosifs: *See—*
Zeller, Bernard M.; Couturier, Rene J.; and Tribot, Robert A., 4,347,087, Cl. 149-98.000.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.": *See—*
Legrand, Paul J.; Dubeau, Michel L.; and Pachomoff, Guy R., 4,346,861, Cl. 244-54.000.
Societe Nationale Industrielle Aerospatiale: *See—*
Beau, Jean-Francois, 4,346,949, Cl. 308-236.000.
Beau, Jean-Francois, 4,347,449, Cl. 310-42.000.
Jousillec, Joseph, 4,346,614, Cl. 74-5.120.
Societe Nationale Industrielle et Aerospatiale: *See—*
Banos, Jean; Cantagrel, Jean-Claude; Cahuzac, Georges; and Darrieux, Jean-Louis, 4,346,741, Cl. 139-387.00R.
Soderberg, John H.: *See—*
Duwel, Edward C.; and Soderberg, John H., 4,347,506, Cl. 340-679.000.
Solarex Corporation: *See—*
Lindmayer, Joseph, 4,347,264, Cl. 430-314.000.
Whitehouse, Daniel L., 4,347,263, Cl. 427-74.000.
Solow, Terry S. Mechanical toothbrush with individual tuft drive. 4,346,492, Cl. 15-22.00R.
Solvay & Cie.: *See—*
De Ceuster, Jean; and Essemaeker, Paul, 4,347,099, Cl. 162-5.000.
Sony Corporation: *See—*
Yamakoshi, Akira; Murakami, Kyoichi; and Niimura, Tsutomu, 4,347,531, Cl. 358-172.000.
Yoshida, Tadao, 4,347,481, Cl. 330-251.000.
Soos, Rudolf: *See—*
Bitter, Istvan; Soos, Rudolf; Toth, Geza; Toke, Laszlo; and Szabo, Gabor, 4,347,377, Cl. 560-32.000.
Sorenson, Richard W., to Carlingswitch, Inc. Switch construction. 4,347,417, Cl. 200-67.00G.
Soulen, John R.: *See—*
Thanawalla, Chandrakant B.; Soulen, John R.; and Monsimer, Harold G., 4,346,710, Cl. 128-272.000.
Souriau & Cie: *See—*
Chesnais, Andre; and Thiery, Philippe, 4,346,955, Cl. 339-97.00R.
Southall, Kenneth, to AMF Incorporated. Method of making filter cell having sealed periphery. 4,347,208, Cl. 264-229.000.
SPACAB AB: *See—*
Knudsen, Niels; Orpana, Veikko; Wisur, Matti; Warulf, Olov; Bergqvist, Hakan; and Afzelius, Raoul, 4,347,401, Cl. 174-14.00R.
Speer, Walter F., to RCA Corporation. Rotary tuning mechanism. 4,347,628, Cl. 455-173.000.
Speier, John L.; and Gentle, Thomas M., to Dow Corning Corporation. Method and apparatus for rapidly freezing molten metals and metalloids in particulate form. 4,347,199, Cl. 264-8.000.
Spencer, Patricia J.; and DeRoeck, Carrie P. Pastry cloth having suction cups removably associated therewith. 4,346,875, Cl. 269-302.100.
Speraggi, Marcello, to Honeywell Information Systems Inc. Document positioning and feeding apparatus for high speed printers. 4,346,883, Cl. 271-274.000.
Sperry Corporation: *See—*
Booth, Donald W., 4,346,901, Cl. 273-408.000.
Spielman, Richard. Light transceiver device. 4,347,438, Cl. 250-221.000.
Spieth, Wolfgang: *See—*
Goertler, Horst; Heizel, Friedrich; Knobloch, Uwe; Muller, Hans; Prohaska, Hans; Rachner, Horst; and Spieth, Wolfgang, 4,347,465, Cl. 318-266.000.
Spooner, Archer M., to Redifon Simulation Limited. Visual display apparatus. 4,347,507, Cl. 340-705.000.
Spooner, Archer M., to Redifon Simulation Limited. Visual display apparatus. 4,347,508, Cl. 340-705.000.
Sprague, Robert A.; and Sarid, Dror, to Xerox Corporation. Light modulator/deflector using acoustic surface waves. 4,346,965, Cl. 350-358.000.
Sprando, Anthony E. Electrical relay. 4,347,548, Cl. 361-210.000.
SRI International: *See—*
Loehman, Ronald E., 4,347,089, Cl. 156-89.000.
Staab, Roger I.: *See—*
Brooks, James L.; Staab, Roger I.; Bowers, James C.; and Nienhaus, Harry A., 4,347,474, Cl. 323-224.000.
Staendeke, Horst; Dany, Franz-Josef; and Kandler, Joachim, to Hoechst Aktiengesellschaft. Particulate agent for impeding the combustibility of combustible substances. 4,347,334, Cl. 524-416.000.
Staffa, Jeffrey A.: *See—*
Lionelle, Joseph E.; Staffa, Jeffrey A.; and McCormick, William L., 4,347,321, Cl. 435-161.000.
Stafford, Richard W.: *See—*
Adams, Richard E.; and Stafford, Richard W., 4,347,493, Cl. 336-192.000.
Stahle, Martin. Centrifugal pump with single blade impeller. 4,347,035, Cl. 415-121.00B.
Stamets, Stanley L.; Winkless, Robert A.; Hernandez, Rafael J.; Merle, Joseph J.; and Payne, Robert D., to Continental Group, Inc., The. Inside powder striping apparatus. 4,346,667, Cl. 118-622.000.
Standard Oil Company: *See—*
Shaw, Wilfrid G.; and Paparizos, Christos, 4,347,163, Cl. 252-435.000.
Standard Oil Company (Indiana): *See—*
Fields, Ellis K., 4,347,384, Cl. 568-37.000.
Stanley Mabo S.A.: *See—*
Jacquet, Daniel, 4,347,088, Cl. 156-69.000.
Stanton, George E., to Nujack Oil Pump Company. Shock absorbing means for a rocker arm type oil well pump. 4,346,620, Cl. 74-583.000.
Stauffer Chemical Company: *See—*
Campbell, Ramsey G., 4,347,391, Cl. 570-252.000.
Epstein, Ronald A.; and Mink, Robert I., 4,347,160, Cl. 252-429.00B.
Michel, Christian G.; Ertell, Carolyn A.; and Burk, Johst H., 4,347,325, Cl. 501-1.000.
Pallos, Ferenc M., 4,347,380, Cl. 564-91.000.
Stefanoni, Romano; and Annoni, Eliseo. Unwinding machine. 4,346,853, Cl. 242-58.100.
Steigerwald, Robert L.: *See—*
Park, John N.; and Steigerwald, Robert L., 4,347,464, Cl. 318-254.000.

Stein Heurtey: *See—*
Lamarque, Gabriel, 4,347,400, Cl. 373-77.000.
Steiner, Urs: *See—*
Friesen, Neil; and Steiner, Urs, 4,347,136, Cl. 210-253.000.
Steinke, Leo: *See—*
Fischer, Hermann; Friese, Karl-Hermann; Gruber, Hans-Ulrich; Heinemann, Wolfgang; Knoll, Gunter; Linder, Ernst; Maurer, Helmut; Noack, Rainer; Steinke, Leo; Weber, Lothar; and Weyl, Helmut, 4,347,113, Cl. 204-195.00S.
Stembridge, William F.; Woodward, Roger P.; and Glassman, Larry H. Imaging sonar system and method. 4,347,591, Cl. 367-104.000.
Sterling Drug Inc.: *See—*
Singh, Baldev, 4,347,363, Cl. 546-249.000.
Wesseler, Eugene P., 4,347,352, Cl. 528-423.000.
Stern, Warren C., to Burroughs Wellcome Co. Prolactin suppression in mammals. 4,347,257, Cl. 424-330.000.
Stetson, Norman B., to Inframetrics, Inc. Scanning mirror arrangement. 4,347,530, Cl. 358-113.000.
Stevens, Violete L.: *See—*
Ginter, Sally P.; Pawloski, Chester E.; and Stevens, Violete L., 4,347,194, Cl. 260-929.000.
Stewart, Finton E.; and Stewart, Sylvia M. L. B. Leather inlay pistol grip and method of manufacture. 4,346,530, Cl. 42-71.00R.
Stewart, Mervin, to Warne Surgical Products Limited. Process for preparing an inflatable pad for a face mask. 4,347,205, Cl. 264-130.000.
Stewart, Sylvia M. L. B.: *See—*
Stewart, Finton E.; and Stewart, Sylvia M. L. B., 4,346,530, Cl. 42-71.00R.
Stirling, Leonard H., to Her Majesty the Queen. Pretensioning diagonals in lattice beam-columns. 4,346,510, Cl. 29-452.000.
Stoltman, Donald D., to General Motors Corporation. Exhaust air flow proportioning valve. 4,346,555, Cl. 60-290.000.
Storz, Kurt: *See—*
Schwaab, Manfred; Puschnerat, Helmut; and Storz, Kurt, 4,346,656, Cl. 101-181.000.
Streifer, William: *See—*
Fekete, Dan H.; Scifres, Donald R.; and Streifer, William, 4,347,612, Cl. 372-50.000.
Scifres, Donald R.; Burnham, Robert D.; and Streifer, William, 4,347,611, Cl. 372-45.000.
Stroud, Lebern W. Dual alternator power system for motor vehicle. 4,347,473, Cl. 320-15.000.
Stumpp, Gerhard; and Wessel, Wolf, to Robert Bosch GmbH. Apparatus for measuring the amount of fluid supplied by a fluid supply device. 4,346,727, Cl. 137-117.000.
Sturgeon, Clayton L., to Texas Instruments Incorporated. Switching power supply. 4,347,559, Cl. 363-21.000.
Suchowerskyj, Wadym: *See—*
Schrauf, Werner; Werner, Peter; Luetkens, Luer; Maue, Hans-Heinrich; and Suchowerskyj, Wadym, 4,346,913, Cl. 280-735.000.
Sudo, Susumu: *See—*
Ohtsuga, Hisao; Uzawa, Koji; Kamuro, Takashi; Sudo, Susumu; Hirose, Tomoyoshi; Miyao, Masafumi; and Koga, Motoyuki, 4,346,922, Cl. 285-109.000.
Suffi, Louis, to Northern Telecom, Inc. Distributing frame and terminal block member assemblies. 4,346,956, Cl. 339-119.00R.
Sugano, Akira; and Tooyama, Eiji, to Hitachi, Ltd. Hierarchical-structure plant control system. 4,347,564, Cl. 364-132.000.
Sugata, Masao: *See—*
Fukuda, Tadaji; Sugata, Masao; Nakagiri, Takashi; and Konishi, Masaki, 4,347,436, Cl. 250-211.00R.
Suggitt, Robert M.: *See—*
Crone, John M., Jr.; and Suggitt, Robert M., 4,347,398, Cl. 585-474.000.
Sugie, Akihiko: *See—*
Katsube, Junki; Shimomura, Hiromi; Inokuma, Shun; and Sugie, Akihiko, 4,347,254, Cl. 424-275.000.
Sugihara, Kazuyoshi: *See—*
Mihara, Kazunobu; and Sugihara, Kazuyoshi, 4,347,412, Cl. 200-42.00T.
Suh, John T.; Williams, Bruce E.; Skiles, Jerry W.; and Loev, Bernard, to USV Pharmaceutical Corporation. Antihypertensive lactams. 4,347,246, Cl. 424-246.000.
Sulzer, Harry E., to Anchor/Darling Industries, Inc. Automated dual mode valve actuator. 4,346,728, Cl. 137-243.600.
Sumitomo Chemical Company, Limited: *See—*
Katsube, Junki; Shimomura, Hiromi; Inokuma, Shun; and Sugie, Akihiko, 4,347,254, Cl. 424-275.000.
Kirino, Osamu; Kato, Toshiro; and Yamamoto, Shigeo, 4,347,188, Cl. 549-436.000.
Saito, Kenji; and Yamachika, Hiroshi, 4,347,386, Cl. 568-310.000.
Yamada, Yasuharu; and Kawai, Kiyoshi, 4,347,157, Cl. 252-429.00B.
Sumitomo Metal Industries, Ltd.: *See—*
Shibahara, Takashi; Kohno, Teruo; and Misaka, Yoshisuke, 4,346,575, Cl. 72-16.000.
Sumitomo Precision Products Company Limited: *See—*
Mukuda, Mutsuo; Murakami, Masahiro; and Aotsuka, Kazuo, 4,347,421, Cl. 219-60.00A.
Sumrell, Gene: *See—*
Bailey, August V.; Boudreaux, Gordon J.; and Sumrell, Gene, 4,347,378, Cl. 560-105.000.
Sundberg, Bertil J.: *See—*
Peabody, Ralph C.; and Sundberg, Bertil J., 4,346,494, Cl. 15-179.000.
Suter, Fritz; and Haag, Paul, to Maschinenfabrik WIFAG. Device for exchanging the form cylinder in a photogravure rotary machine. 4,346,655, Cl. 101-153.000.
Sutton, Joel F.: *See—*
Jones, John C.; Sifford, Perry P.; and Sutton, Joel F., 4,347,040, Cl. 416-190.000.
Suzuki, Hiroshi: *See—*
Osumi, Yasuaki; Suzuki, Hiroshi; Kato, Akihiko; and Nakane, Masanori, 4,347,082, Cl. 75-171.000.
Suzuki, Masayuki: *See—*
Katsuma, Makoto; Suzuki, Masayuki; Shinbori, Kenichi; and Murakami, Hiroyasu, 4,346,973, Cl. 354-152.000.
Suzuki, Sadao, to Yoshino Kogyosho Co., Ltd. Method for molding elongated parisons. 4,347,209, Cl. 264-250.000.
Suzuki, Takeo: *See—*
Ohta, Shigeo; and Suzuki, Takeo, 4,347,482, Cl. 330-298.000.
Suzuki, Yoshio; and Shimizu, Masao, to Niigata Engineering Co., Ltd. Method for reducing the bacterial population of blood powder. 4,347,259, Cl. 426-465.000.
Svehaug, Oswald C. Slurry separator having reaction nozzle driven rotory blades wiping a conical filter. 4,347,134, Cl. 210-147.000.
Swaisgood, Harold E.: *See—*
Brown, Rodney J.; and Swaisgood, Harold E., 4,347,312, Cl. 435-7.000.
Swann, Julian B. Shopping cart with auxiliary load carrier. 4,346,907, Cl. 280-47.180.
Swanson, William C.; and Heersink, Evert J., to International Harvester Co. Agricultural implement sectional frame with depth limit. 4,346,763, Cl. 172-2.000.
Swart, Daniel J., to Dow Chemical Company, The. Linear polyesters from aromatic dicarboxylic acids and cyclic alkylene carbonates prepared using six-membered aromatic nitrogen-containing heterocyclic groups. 4,347,351, Cl. 528-271.000.
Sweeney, Edmund F., to Allied Corporation. Communications systems utilizing a retrodirective antenna having controllable reflectivity characteristics. 4,347,512, Cl. 343-6.50R.
Syntex (U.S.A.) Inc.: *See—*
Muchowski, Joseph M.; and Greenhouse, Robert, 4,347,185, Cl. 260-326.250.
Muchowski, Joseph M.; and Greenhouse, Robert, 4,347,186, Cl. 548-516.000.
Muchowski, Joseph M.; and Greenhouse, Robert, 4,347,187, Cl. 548-516.000.
System E Controls Ltd.: *See—*
Davis, John M.; and Burton, Barrie C., 4,347,492, Cl. 336-136.000.
Szabo, Gabor: *See—*
Bitter, Istvan; Soos, Rudolf; Toth, Geza; Toke, Laszlo; and Szabo, Gabor, 4,347,377, Cl. 560-32.000.
Szabo, William. Weight lifting exercising apparatus having a movable carriage. 4,346,888, Cl. 272-118.000.
Szczepanski, Henry: *See—*
Lukaszczyk, Alfons; Martin, Henry; Diel, Peter J.; Fory, Werner; Gatzi, Karl; Kristinsson, Haukur; Muller, Beat; Muntwyler, Rene; Pachlatko, Johannes P.; Rempfler, Hermann; Schurter, Rolf; and Szczepanski, Henry, 4,347,372, Cl. 548-217.000.
Szentlaszloi, Alexander: *See—*
Duttera, James; Jefferis, Raymond P., III; Matteson, David; and Szentlaszloi, Alexander, 4,347,127, Cl. 209-164.000.
Taguchi, Tatsuya: *See—*
Kawabata, Takashi; Tsunekawa, Tokuichi; Hosoe, Kazuya; Kinoshita, Takao; Sakai, Shinji; and Taguchi, Tatsuya, 4,346,970, Cl. 354-25.000.
Taito Co., Ltd.: *See—*
Touyama, Ryousuke; Inouye, Hiroyuki; Shingu, Tetsuro; Takeda, Yoshio; Ikumoto, Takeshi; Okuyama, Hidetoshi; and Yamamoto, Osamu, 4,347,356, Cl. 542-430.000.
Takagi, Takeji; and Hosaka, Kiyokazu, to Olympus Optical Co., Ltd. Flexible tube and method of manufacturing same. 4,347,204, Cl. 264-127.000.
Takahashi, Hideyuki: *See—*
Takano, Hirotaka; Takahashi, Hideyuki; Hirogohri, Ryoichi; and Kato, Kohji, 4,347,396, Cl. 585-441.000.
Takahashi, Naoya: *See—*
Sato, Atsushi; Takahashi, Naoya; Endo, Keiji; and Yanagishita, Hitoshi, 4,347,169, Cl. 252-567.000.
Takahashi, Tadashi: *See—*
Miyashita, Kunio; Takahashi, Tadashi; and Morinaga, Shigeki, 4,347,536, Cl. 360-107.000.
Takahashi, Tamotsu, to Copal Company Limited. Camera equipped with an automatically controlling device for focusing and shutter operation. 4,346,972, Cl. 354-195.000.
Takaichi, Kazuyoshi: *See—*
Kaibara, Nobuhiro; and Takaichi, Kazuyoshi, 4,346,688, Cl. 123-502.000.
Takanashi, Itsuo; Nakagaki, Shintaro; Miyoshi, Tadayoshi; Motoyama, Koichiro; Miyazaki, Kenichi; and Yokokawa, Sumio, to Victor Company of Japan, Ltd. Color-resolving striped filter for camera tube. 4,347,529, Cl. 358-44.000.
Takano, Hirotaka; Takahashi, Hideyuki; Hirogohri, Ryoichi; and Kato, Kohji, to Mitsubishi Petrochemical Co., Ltd. Process for producing styrene. 4,347,396, Cl. 585-441.000.

Takao, Hiroshi: *See*—
Kimura, Shinji; Takao, Hiroshi; Ambe, Satoshi; and Akimune, Yoshio, 4,347,114, Cl. 204-195.00S.

Takasago Perfumery Co., Ltd.: *See*—
Akutagawa, Susumu; and Taketomi, Takanao, 4,347,387, Cl. 568-450.000.

Takatsu, Huehiro. Hemming apparatus. 4,346,579, Cl. 72-314.000.

Takayama, Yoshiaki: *See*—
Asano, Masaya; Mori, Yoichi; and Takayama, Yoshiaki, 4,347,303, Cl. 430-272.000.

Takeda, Norio: *See*—
Isshiki, Tomiya; Tomita, Tetsuo; Sakaguchi, Shuzabu; Kohzaki, Toshiaki; Aoki, Osamu; Takeda, Norio; and Aoki, Yoshiyuki, 4,347,383, Cl. 564-249.000.

Takeda, Shiro; and Nakajima, Minoru, to Fujitsu Limited. Method of manufacturing electronic device having multilayer wiring structure. 4,347,306, Cl. 427-96.000.

Takeda, Yoshio: *See*—
Touyama, Ryousuke; Inouye, Hiroyuki; Shingu, Tetsuro; Takeda, Yoshio; Ikumoto, Takeshi; Okuyama, Hidetoshi; and Yamamoto, Osamu, 4,347,356, Cl. 542-430.000.

Takenaka, Yoshihiro: *See*—
Yoshimura, Minoru; Takenaka, Yoshihiro; Ikeda, Shigeho; and Yoshii, Hiroe, 4,347,317, Cl. 435-110.000.

Taketomi, Takanao: *See*—
Akutagawa, Susumu; and Taketomi, Takanao, 4,347,387, Cl. 568-450.000.

Takeuchi, Shinji: *See*—
Sakamoto, Masaaki; and Takeuchi, Shinji, 4,346,618, Cl. 74-491.000.

Takeuchi, Tetsuo; Mukunoki, Yasuo; and Minanizono, Junji, to Fuji Photo Film Co., Ltd. Photographic materials. 4,347,308, Cl. 430-529.000.

Takeuchi, Yoshiyuki: *See*—
Shiozawa, Shookichi; Nakayama, Tomomi; Haga, Kyosuke; Abe, Ryutaro; and Takeuchi, Yoshiyuki, 4,347,047, Cl. 417-310.000.

Taki, Waro: *See*—
Handa, Hajime; Yonekawa, Yasuhiro; Yamagata, Sen; Taki, Waro; Ikada, Yoshito; and Iwata, Hiroo, 4,346,712, Cl. 128-325.000.

Tam, Matthias L., to Rockwell International Corporation. Voltage-temperature insensitive on-chip reference voltage source compatible with VLSI manufacturing techniques. 4,347,476, Cl. 323-313.000.

Tamai, Masayoshi: *See*—
Kikuchi, Masatsugu; and Tamai, Masayoshi, 4,347,519, Cl. 346-75.000.

Tamura, Shuichi: *See*—
Kimura, Hiroyuki; Tamura, Shuichi; and Yokota, Hideo, 4,346,988, Cl. 356-1.000.

Tamura, Yasuyuki: *See*—
Kuge, Tsukasa; Tamura, Yasuyuki; and Tanigawa, Koichi, 4,346,986, Cl. 355-14.0CH.

Tanaka, Junzo: *See*—
Ikeda, Nobuo; Tanaka, Junzo; and Yoshimura, Hirofumi, 4,347,420, Cl. 219-10.55D.

Tanaka, Kozo: *See*—
Saji, Yasuo; Tanaka, Kozo; and Yamauchi, Takashi, 4,347,279, Cl. 428-294.000.

Tanaka, Masahide: *See*—
Nakamura, Akiyoshi; Ogura, Toshinobu; and Tanaka, Masahide, 4,346,966, Cl. 350-412.000.

Tanaka, Tadashi: *See*—
Yanobu, Hideo; and Tanaka, Tadashi, 4,346,551, Cl. 57-62.000.

Tanaka, Yukio, to Murata Manufacturing Co., Ltd. Ceramic capacitor with terminals in sockets. 4,347,551, Cl. 361-307.000.

Tanigawa, Koichi: *See*—
Kuge, Tsukasa; Tamura, Yasuyuki; and Tanigawa, Koichi, 4,346,986, Cl. 355-14.0CH.

Taniguchi, Nobuyuki; Nakai, Masaaki; Ishida, Tokuji; and Uchida, Isamu, to Minolta Camera Company. Operating aid arrangement for cameras. 4,346,978, Cl. 354-289.000.

Tanner Chemical Company, Inc.: *See*—
Self, James M., 4,347,331, Cl. 521-119.000.

Tanskanen, Paavo T., to Orion-yhtyma Oy. Process for the preparation of a mixture of an anti-inflammatory steroid and a fluoro-chlorohydrocarbon to be used as a propellant. 4,347,236, Cl. 424-45.000.

Taplin, Lael B., to Bendix Corporation, The. Means for improving automobile driveability. 4,346,776, Cl. 180-179.000.

Tasker, Sidney. Automatic flexible container fabricating machine. 4,346,546, Cl. 53-412.000.

Tatar, Richard, to Del-Met Corporation. Wheel cover locking assemblies. 4,346,940, Cl. 301-37.0AT.

Tateno, Kohkichi. Joint for use in concrete deposit. 4,346,542, Cl. 52-396.000.

Tatsuo, Masahiro, to Kabushiki Kaisha Komatsu Seisakusho. Variable speed planetary transmission. 4,346,623, Cl. 74-764.000.

Taunton, John W.: *See*—
Bauman, Richard F.; Taunton, John W.; Anderson, George H.; Trachte, Ken L.; and Hsia, Steve J., 4,347,117, Cl. 208-8.0LE.

Taylor, Elizabeth C. Apparatus for mitering mold and the like. 4,346,636, Cl. 83-767.000.

Taylor, Peter F.; Tuchyner, Harold J.; Basiulis, Algerd; and Lamp, Thomas R., to Hughes Aircraft Company. Thermal jacket for elongated structures. 4,346,643, Cl. 89-14.100.

Taylor, Robert E.; Rautiola, Norman A.; and Miller, Gerald K., to Nartron Corporation, a part interest. Automotive backlight heater and timing control means. 4,347,444, Cl. 307-141.000.

Tayot, Jean-Louis: *See*—
Mynard, Marie-Claude; and Tayot, Jean-Louis, 4,347,244, Cl. 424-180.000.

TBA Industrial Products, Limited: *See*—
Willis, John H.; and Heath, Trevor C., 4,347,071, Cl. 65-10.200.

TDK Electronics Co., Ltd.: *See*—
Masujima, Sho; and Iwaya, Shoichi, 4,346,537, Cl. 51-413.000.
Tokuoka, Yasumichi, 4,347,291, Cl. 428-694.000.

TE KA DE Felten & Guilleaume Fernmeldeanlagen GmbH: *See*—
Schmidt, Hans, 4,347,601, Cl. 370-58.000.

Tedstone, Donald J., to Pratt & Whitney Aircraft of Canada Limited. Vane fairing for inertial separator. 4,346,860, Cl. 244-53.00B.

Teepak, Inc.: *See*—
Martinek, Thomas W., 4,346,738, Cl. 138-118.100.

Teichmann, Robert J.; and Mayer, Linda J., to Hooker Chemicals & Plastics Corp. Electroplating tin and tin alloys and baths therefor. 4,347,107, Cl. 204-44.000.

Teijin Limited: *See*—
Hara, Takeshi; and Kayama, Yasutaka, 4,347,369, Cl. 548-149.000.
Ono, Syoji; Miura, Shuzi; and Yoshida, Tsunemasa, 4,347,179, Cl. 260-112.00B.

Teixeira, Walter J.: *See*—
Hibbs, Joseph E.; Chalmers, Gerald W.; and Teixeira, Walter J., 4,346,658, Cl. 102-254.000.

Telefonaktiebolaget L M Ericsson: *See*—
Akerberg, Dag, 4,347,501, Cl. 340-539.000.

Telmec Co., Ltd.: *See*—
Imahashi, Issei, 4,347,452, Cl. 310-76.000.

Tennant, Jerald L.; and Smirmaul, Heinz J. Living contact lens. 4,346,482, Cl. 3-13.000.

Teramoto, Kazuo: *See*—
Yoshioka, Toshio; Teramoto, Kazuo; and Shimamura, Masaharu, 4,347,316, Cl. 435-94.000.

Teumer, Roger G., to Xerox Corporation. Tilted deflection electrode method and apparatus for liquid drop printing systems. 4,347,521, Cl. 346-75.000.

Texaco Inc.: *See*—
Brown, Winthrop K., 4,346,590, Cl. 73-151.000.
Crone, John M., Jr.; and Suggitt, Robert M., 4,347,398, Cl. 585-474.000.
Ganster, Charles A.; and Nelson, Gerald V., 4,347,577, Cl. 364-501.000.

Texas Instruments Incorporated: *See*—
Rao, G. R. Mohan, 4,347,587, Cl. 365-189.000.
Sturgeon, Clayton L., 4,347,559, Cl. 363-21.000.

Thanawalla, Chandrakant B.; Soulen, John R.; and Monsimer, Harold G., to Pennwalt Corporation. Article for storage and transport of biogenic fluids. 4,346,710, Cl. 128-272.000.

Thiery, Philippe: *See*—
Chesnais, Andre; and Thiery, Philippe, 4,346,955, Cl. 339-97.00R.

Thomas, Charles H., to Westinghouse Electric Corp. High bond strength aqueous phenol modified polyester coating composition. 4,347,335, Cl. 524-538.000.

Thomas, Delbert D. Horizontal oil shale and tar sands retort. 4,347,119, Cl. 208-11.00R.

Thomas, Eric J.: *See*—
Giddings, Peter J.; John, David I.; and Thomas, Eric J., 4,347,182, Cl. 260-245.20R.

Thomson-Brandt: *See*—
Lainez, Lucien, 4,347,527, Cl. 358-4.000.

Thomson-CSF: *See*—
Lemonon, Claire; and Micheron, Francois, 4,346,505, Cl. 29-25.350.

Thorpe, Joseph F., to Cheddar Valley Engineering Limited. Roll pallet. 4,346,906, Cl. 280-33.99H.

Thyssen Aktiengesellschaft vorm. August Thyssen-Hutte: *See*—
Espenhahn, Manfred; and Folwaczny, Manfred, 4,347,115, Cl. 204-206.000.

Tilbor, Neil: *See*—
Cooper, Julius; and Tilbor, Neil, 4,346,894, Cl. 273-86.00B.

Timperley, Doreen A.: *See*—
Smith, Eileen; Timperley, Doreen A.; and Titchener, Dorothy M., 4,347,149, Cl. 252-102.000.

Ting, Raymond M. L. Blow-in/blow-out double-skin wall construction. 4,346,538, Cl. 52-1.000.

Tip Top Remaco Ltd.: *See*—
Schorscher, John J., 4,347,096, Cl. 156-583.300.

Titchener, Dorothy M.: *See*—
Smith, Eileen; Timperley, Doreen A.; and Titchener, Dorothy M., 4,347,149, Cl. 252-102.000.

Togami, Yuji, to Nippon Hoso Kyokai. Method of making a recording medium. 4,347,112, Cl. 204-192.00M.

Toho Beslon Co., Ltd.: *See*—
Saji, Yasuo; Tanaka, Kozo; and Yamauchi, Takashi, 4,347,279, Cl. 428-294.000.

Tokai Electric Wire Company Limited: *See*—
Fukao, Yasuyosi; and Mayumi, Hisaki, 4,346,957, Cl. 339-119.00R.

Toke, Laszlo: *See*—
Bitter, Istvan; Soos, Rudolf; Toth, Geza; Toke, Laszlo; and Szabo, Gabor, 4,347,377, Cl. 560-32.000.

Tokumoto, Masao: *See*—
Ozawa, Hiroshi; and Tokumoto, Masao, 4,347,299, Cl. 430-122.000.

Tokuoka, Yasumichi, to TDK Electronics Co., Ltd. Magnetic recording medium and preparation thereof. 4,347,291, Cl. 428-694.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Hashizume, Masao; and Kitazawa, Akira, 4,347,605, Cl. 370-88.000.

Koda, Akira; Sato, Fumitaka; and Nishibe, Shinji, 4,347,566, Cl. 364-200.000.
Mizuyama, Akinori; and Ogita, Tadahisa, 4,347,451, Cl. 310-59.000.
Sato, Hajime; Morisue, Tetsuo; and Heki, Hideaki, 4,347,214, Cl. 376-251.000.
Yamaura, Mitsuru; Kondow, Ryotaro; Mitani, Megumu; and Nii, Yoshiji, 4,347,581, Cl. 364-900.000.
Toledo Stamping & Manufacturing Company: *See*—
Wherry, Joseph L., 4,346,678, Cl. 123-90.440.
Tomasetti, Charles M.; and Ulaky, John A., to RCA Corporation. Photomultiplier tube having a gain modifying Nichrome dynode. 4,347,458, Cl. 313-103.00R.
Tomcufcik, Andrew S.: *See*—
Wright, William B., Jr.; Tomcufcik, Andrew S.; and Marsico, Joseph W., Jr., 4,347,248, Cl. 424-251.000.
Tomiita, Kazuo: *See*—
Negishi, Takao; and Tomiita, Kazuo, 4,346,552, Cl. 57-208.000.
Tomita, Tetsuo: *See*—
Isshiki, Tomiya; Tomita, Tetsuo; Sakaguchi, Shuzabu; Kohzaki, Toshiaki; Aoki, Osamu; Takeda, Norio; and Aoki, Yoshiyuki, 4,347,383, Cl. 564-249.000.
Tooyama, Eiji: *See*—
Sugano, Akira; and Tooyama, Eiji, 4,347,564, Cl. 364-132.000.
Toray Industries, Inc.: *See*—
Asano, Masaya; Mori, Yoichi; and Takayama, Yoshiaki, 4,347,303, Cl. 430-272.000.
Negishi, Takao; and Tomiita, Kazuo, 4,346,552, Cl. 57-208.000.
Yoshioka, Toshio; Teramoto, Kazuo; and Shimamura, Masaharu, 4,347,316, Cl. 435-94.000.
Toray Industries, Ltd.: *See*—
Ohkada, Shinzo; and Kenjo, Hideki, 4,347,198, Cl. 264-2.300.
Torii, Hideyasu; and Nakamura, Susumu, to Dainichiseika Color & Chemicals Mfg. Co., Ltd.; and Ukima Colour & Chemicals Mfg. Co., Ltd. Process for preparing thermosettable polyurethane which comprises blending a polyisocyanate with a first thermoplastic resin and then blending with a second thermoplastic resin which is a polyurethane. 4,347,338, Cl. 525-123.000.
Tornya, Andrew G. Balustrade construction. 4,346,872, Cl. 256-65.000.
Tosaki, Hiromi; Arima, Hideo; Mozume, Teruo; Ikegami, Akira; Isogai, Tokio; and Tsubokawa, Ichiro, to Hitachi, Ltd. Thermistor composition. 4,347,166, Cl. 252-519.000.
Toshiba Electric Equipment Corporation: *See*—
Matsushita, Nobuo, 4,347,554, Cl. 362-297.000.
Tosi, Bruno: *See*—
Sisti, Giorgio; Tosi, Bruno; and Trestianu, Sorin, 4,347,215, Cl. 422-63.000.
Total Transportation Systems (International) A/S: *See*—
Garlung, Walther; and Dahl, Helge, 4,346,808, Cl. 212-212.00.
Toth, Geza: *See*—
Bitter, Istvan; Soos, Rudolf; Toth, Geza; Toke, Laszlo; and Szabo, Gabor, 4,347,377, Cl. 560-32.000.
Touyama, Ryousuke; Inouye, Hiroyuki; Shingu, Tetsuro; Takeda, Yoshio; Ikumoto, Takeshi; Okuyama, Hidetoshi; and Yamamoto, Osamu, to Taito Co., Ltd. Novel nitrogen-containing monoterpene derivatives. 4,347,356, Cl. 542-430.000.
Tovim, Igal. Plastics material horseshoes. 4,346,762, Cl. 168-4.000.
Towsend, Marvin S. Snow plow attachment. 4,346,928, Cl. 294-51.000.
Toyama, Tadao: *See*—
Shiba, Keisuke; and Toyama, Tadao, 4,347,305, Cl. 430-302.000.
Toyo Engineering Corporation: *See*—
Zamma, Jun; Makino, Isao; Mii, Toshiyuki; and Shima, Kazumi, 4,347,221, Cl. 422-207.000.
Toyo Jozo Kabushiki Kaisha: *See*—
Imamura, Shigeyuki; Matsumoto, Tohru; Muto, Naoki; and Misaki, Hideo, 4,347,323, Cl. 435-194.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Goto, Takeshi; Kawakami, Noboru; Hirano, Itsuo; Itakura, Yoichi; and Kawahara, Yuji, 4,347,077, Cl. 75-0.50B.
Ohno, Shotaro; Koyama, Kenji; and Fukuda, Mitsutoshi, 4,347,138, Cl. 210-639.000.
Toyoda Koki Kabushiki Kaisha: *See*—
Asano, Hiroaki; Ota, Hiroshi; and Yamakage, Kenji, 4,346,535, Cl. 51-101.00R.
Kawabata, Minoru; Honaga, Susumu; and Inaguma, Yoshiharu, 4,347,048, Cl. 417-310.000.
Shiozawa, Shookichi; Nakayama, Tomomi; Haga, Kyosuke; Abe, Ryutaro; and Takeuchi, Yoshiyuki, 4,347,047, Cl. 417-310.000.
Toyota Jidosha K.K.: *See*—
Inagaki, Masao; and Sato, Shigeru, 4,346,837, Cl. 236-34.500.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Akiyama, Susumu; Ito, Kenzo; Fukaya, Hiroyasu; Ogiso, Haruhiko; Hirabayashi, Yuji; and Kawamura, Takahide, 4,347,570, Cl. 364-431.040.
Fukao, Yasuyosi; and Mayumi, Hisaki, 4,346,957, Cl. 339-119.00R.
Shiozawa, Shookichi; Nakayama, Tomomi; Haga, Kyosuke; Abe, Ryutaro; and Takeuchi, Yoshiyuki, 4,347,047, Cl. 417-310.000.
Wakita, Nobuaki; and Kanai, Hiroshi, 4,346,686, Cl. 123-339.000.
Trachte, Ken L.: *See*—
Bauman, Richard F.; Taunton, John W.; Anderson, George H.; Trachte, Ken L.; and Hsia, Steve J., 4,347,117, Cl. 208-8.0LE.
Treadwell, William A., to Eaton Corporation. Vehicle speed control. 4,346,775, Cl. 180-175.000.
Trestianu, Sorin: *See*—
Sisti, Giorgio; Tosi, Bruno; and Trestianu, Sorin, 4,347,215, Cl. 422-63.000.
Tribot, Robert A.: *See*—
Zeller, Bernard M.; Couturier, Rene J.; and Tribot, Robert A., 4,347,087, Cl. 149-98.000.
Triumph-Adler A.G.: *See*—
Lendl, Josef, 4,347,005, Cl. 400-144.200.
Trost, Elmar; and Reusch, Rudolf, to Rheinmetall GmbH. Pull-through structure for measuring the curvature of the internal wall of a pipe or tube. 4,346,993, Cl. 356-138.000.
Trott, W. James, to United States of America, Navy. Piezoceramic tubular element with zero end displacement. 4,347,593, Cl. 367-159.000.
Trotter, Albin; and Trotter, Ursus. Instantaneous water heater gas control valve. 4,346,835, Cl. 236-24.000.
Trotter, Ursus: *See*—
Trotter, Albin; and Trotter, Ursus, 4,346,835, Cl. 236-24.000.
TRW Inc.: *See*—
Cooper, Paul, 4,347,041, Cl. 417-15.000.
Tschan, Rene, to Lonza Ltd. Process for the introduction of a piece of foam plastic into a pocket fitted to it. 4,346,509, Cl. 29-451.000.
Tschanz, Pierre. World watch. 4,347,594, Cl. 368-21.000.
Tschunt, Edgar, to Siemens Aktiengesellschaft. X-ray diagnostic apparatus for producing transverse layer images. 4,347,624, Cl. 378-10.000.
Tsuboi, Nobuyuki. Multipurpose reciprocal bearing unit. 4,346,945, Cl. 308-6.00R.
Tsubokawa, Ichiro: *See*—
Tosaki, Hiromi; Arima, Hideo; Mozume, Teruo; Ikegami, Akira; Isogai, Tokio; and Tsubokawa, Ichiro, 4,347,166, Cl. 252-519.000.
Tsuchida, Takayasu: *See*—
Miwa, Kiyoshi; Tsuchida, Takayasu; Kurahashi, Osamu; Nakamori, Shigeru; Sano, Konosuke; and Momose, Haruo, 4,347,318, Cl. 435-115.000.
Tsuchikawa, Sunzo: *See*—
Hayashi, Masaharu; and Tsuchikawa, Sunzo, 4,347,038, Cl. 416-132.00A.
Tsuchimoto, Takamitsu: *See*—
Kaneda, Saburo; Tsuchimoto, Takamitsu; Shimizu, Kazuyuki; and Ikegami, Fujio, 4,347,565, Cl. 364-200.000.
Tsuda, Toshitaka: *See*—
Murano, Kazuo; Yamaguchi, Kazuo; Murakami, Norio; and Tsuda, Toshitaka, 4,347,617, Cl. 375-22.000.
Tsujii, Yasuhiro: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; Shigehara, Itaru; Nagatani, Kuniaki; and Nishimura, Shigeyuki, 4,347,390, Cl. 570-202.000.
Tsukanova, Galina M.: *See*—
Yasnitsky, Boris G.; Tsukanova, Galina M.; Oridoroga, Valentin A.; and Furmanov, Jury A., 4,347,056, Cl. 8-116.00R.
Yasnitsky, Boris G.; Tsukanova, Galina M.; Oridoroga, Valentin A.; and Furmanov, Jury A., 4,347,057, Cl. 8-116.00R.
Tsunekawa, Tokuichi: *See*—
Kawabata, Takashi; Tsunekawa, Tokuichi; Hosoe, Kazuya; Kinoshita, Takao; Sakai, Shinji; and Taguchi, Tatsuya, 4,346,970, Cl. 354-25.000.
Tsunoda, Michinori: *See*—
Yoneda, Tadao; and Tsunoda, Michinori, 4,346,615, Cl. 74-7.00A.
Tsutomu, Obayashi; and Mituo, Endou, to Hiraoka & Co., Ltd. White cover sheet material capable of reflecting ultraviolet rays. 4,347,284, Cl. 428-328.000.
Tuchiya, Yoshimasa: *See*—
Iwata, Hidefumi; Tuchiya, Yoshimasa; and Iidaka, Toshiharu, 4,346,932, Cl. 296-216.000.
Tuchyner, Harold J.: *See*—
Taylor, Peter F.; Tuchyner, Harold J.; Basiulis, Algerd; and Lamp, Thomas R., 4,346,643, Cl. 89-14.100.
Tunnecliffe, Theodore N.: *See*—
Chute, Richard; Larson, Jay M.; Tunnecliffe, Theodore N.; and Worthen, Roger P., 4,346,870, Cl. 251-356.000.
Turconi, Franco. Derivatives of 4-methyl-5-[(2-aminoethyl)-thiomethyl]-imidazole. 4,347,373, Cl. 548-336.000.
Turner, Robert C.; and Holman, Rury R. Liquid sample collector device. 4,346,613, Cl. 73-864.510.
Turner, William A.; and Nunnelee, Johnny R. Mounting depth-finders, or fish finders. 4,347,013, Cl. 403-4.000.
Tuttle, Douglas E. Reproducing surface testing method and apparatus. 4,346,588, Cl. 73-105.000.
Tuvell, Melvin E., to Ethyl Corporation. Method of treating long chain alkyl amines or products derived therefrom. 4,347,381, Cl. 564-2.000.
Tyner, Alfred E., to Brunswick Corporation. Two-cycle V-engine with integrally cast exhaust manifold. 4,346,676, Cl. 123-41.740.
Tzakis, George J.: *See*—
Johnson, Fred D.; and Tzakis, George J., 4,347,528, Cl. 358-10.000.
Ube Industries, Ltd.: *See*—
Yajima, Seishi; Okamura, Kiyohito; Hasegawa, Yoshio; and Yamamura, Takemi, 4,347,347, Cl. 528-30.000.
Uchida, Isamu: *See*—
Taniguchi, Nobuyuki; Nakai, Masaaki; Ishida, Tokuji; and Uchida, Isamu, 4,346,978, Cl. 354-289.000.
Ueda, Mitsuru, to Nippondenso Co., Ltd. Electric alarm device. 4,347,500, Cl. 340-388.000.
Ueno, Hitoshi; Yazaki, Shirokazu; and Ayukawa, Yukitada, to Pioneer Electronic Corporation. Door construction for electronic equipment. 4,346,950, Cl. 312-138.00R.
Ueno, Kouji: *See*—
Fukushima, Toshitaka; Koyama, Kazumi; Ueno, Kouji; Kawabata, Yuichi; and Miyamura, Tamio, 4,347,584, Cl. 365-104.000.

Ueno, Kunimitsu, to Kabushiki Kaisha Komatsu Seisakusho. Drive mechanism with clutch and brake assemblies. 4,346,796, Cl. 192-18.00A.

Uffner, William E., to Owens-Corning Fiberglas Corporation. Chemically modified asphalt joint sealing compositions. 4,347,171, Cl. 524-71.000.

Uhde GmbH: *See—*
Wolstein, Friedrich; and Koch, Gerhard, 4,347,228, Cl. 423-321.00R.

Uhle, Heiko, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Fastening device for externally coupling loads on aircraft. 4,346,642, Cl. 89-1.50B.

Uhlmann, Gerd: *See—*
Merkenich, Karl; Koch, Wilhelm; Glandorf, Kaete; Uhlmann, Gerd; and Scheurer, Guenther, 4,347,258, Cl. 426-334.000.

Ukima Colour & Chemicals Mfg. Co., Ltd.: *See—*
Torii, Hideyasu; and Nakamura, Susumu, 4,347,338, Cl. 525-123.000.

Ulaky, John A.: *See—*
Tomasetti, Charles M.; and Ulaky, John A., 4,347,458, Cl. 313-103.00R.

Ullin, Ulf, to ASEA Aktiebolag. Overvoltage protection device mainly for vehicle-bound electronic equipment. 4,347,475, Cl. 323-303.000.

Ullrich, Horst: *See—*
Kister, Horst; and Ullrich, Horst, 4,347,602, Cl. 370-85.000.

Union Carbide Corporation: *See—*
Sara, Raymond V., 4,347,083, Cl. 75-204.000.

Union Oil Company of California: *See—*
Hass, Robert H.; and Albertson, Walter, 4,347,227, Cl. 423-235.000.

Uniroyal, Inc.: *See—*
Nudenberg, Walter; Rim, Yong S.; and Matthews, Demetreos N., 4,347,159, Cl. 252-429.00B.

Unishear Mixers Limited: *See—*
Platts, Stanley A., 4,347,004, Cl. 366-137.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Elliott, Charles T., 4,347,526, Cl. 357-30.000.

United Merchants & Manufacturers, Inc.: *See—*
Gregorian, Razmic S.; and Namboodri, Chettoor G., 4,347,145, Cl. 252-8.600.

United States of America
Agriculture: *See—*
Bailey, August V.; Boudreaux, Gordon J.; and Sumrell, Gene, 4,347,378, Cl. 560-105.000.
Air Force: *See—*
Birkemeier, William P., 4,347,514, Cl. 343-100.0CS.
Schindler, John K., 4,347,513, Cl. 343-18.00E.
Army: *See—*
Gould, Larry D.; and Garfield, Donald E., 4,346,602, Cl. 73-842.000.
Jasper, Louis J., Jr., 4,347,419, Cl. 219-10.55A.
Olenick, John G.; and Lorenz, Patrick E., 4,346,608, Cl. 73-863.210.
Rand, John H., 4,346,612, Cl. 73-864.440.
Richburg, Ernest H., 4,346,862, Cl. 244-137.00R.
Energy: *See—*
Gardner, Harold S., 4,346,730, Cl. 137-375.000.
Jones, Donald E.; Parker, DeRay; and Boren, Paul R., 4,346,511, Cl. 29-458.000.
Rapier, Pascal M., 4,346,560, Cl. 60-641.300.
Skladzien, Stanley B.; and Raue, Donald J., 4,346,605, Cl. 73-861.130.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Gary, Bruce L. CAT Altitude avoidance system. 4,346,595, Cl. 73-178.00R.
Pivirotto, Thomas J. Method and apparatus for convection control of metallic halide vapor density in a metallic halide laser. 4,347,613, Cl. 372-56.000.
National Aeronautics and Space Administration: *See—*
Gammell, Paul M., 4,346,715, Cl. 128-422.000.
Imig, Leland A.; and Gardner, Mickey R., 4,346,754, Cl. 374-46.000.
Rhodes, David B., 4,346,990, Cl. 356-28.500.
Navy: *See—*
Bond, James W., 4,347,580, Cl. 364-824.000.
Brooks, James L.; Staab, Roger I.; Bowers, James C.; and Nienhaus, Harry A., 4,347,474, Cl. 323-224.000.
Carnaghan, Luason L.; and Phillips, Raymond J., 4,346,953, Cl. 339-28.000.
Esterowitz, Leon; Allen, Roger E.; Kruer, Melvin R.; and Bartoli, Filbert J., 4,347,485, Cl. 372-42.000.
Hibbs, Joseph E.; Chalmers, Gerald W.; and Teixeira, Walter J., 4,346,658, Cl. 102-254.000.
Hoover, Mervyn C., Jr., 4,347,515, Cl. 343-100.0ME.
Kaloi, Cyril M., 4,347,517, Cl. 343-700.0MS.
Long, James M., 4,347,025, Cl. 411-201.000.
Rogers, Kenneth H., 4,346,662, Cl. 114-20.00R.
Schwager, Joseph E.; and Urban, Harry E., 4,347,403, Cl. 179-1.0SA.
Trott, W. James, 4,347,593, Cl. 367-159.000.
Wood, Stanley E.; and Moore, Kenneth L., 4,347,439, Cl. 250-222.00R.

U.S. Philips Corporation: *See—*
Dil, Jan G.; Driessen, Johannes C.; and Mesman, Wichert, 4,347,441, Cl. 250-560.000.
Hoogeveen, Jacobus, 4,347,606, Cl. 370-105.000.
Korver, Jan A. C., 4,347,532, Cl. 358-183.000.
Meuleman, Lambertus J., 4,347,610, Cl. 372-29.000.
Minnema, Lourens; and Van Boekel-Mol, Grietje N., 4,347,288, Cl. 428-389.000.
United Technologies Corporation: *See—*
Cullen, Donald E., 4,346,597, Cl. 73-510.000.
Jones, John C.; Sifford, Perry P.; and Sutton, Joel F., 4,347,040, Cl. 416-190.000.
Kesten, Arthur S.; and Haught, Alan F., 4,346,752, Cl. 165-1.000.
Universal Materials Company Limited: *See—*
Russell, Leonard V.; and Beaney, Derek N., 4,346,896, Cl. 273-195.00A.
University of California, The Regents of the: *See—*
Miller, Robert J., 4,346,737, Cl. 138-42.000.
University of Illinois Foundation: *See—*
Payne, David A.; and Park, Sang M., 4,347,167, Cl. 252-520.000.
University of Rochester, The: *See—*
Mourou, Gerard, 4,347,437, Cl. 250-211.00R.
Unnerstall, Paul J. Logic circuit for part detector. 4,347,546, Cl. 361-179.000.
UOP Inc.: *See—*
Dodd, Malcolm J.; and Juhas, Joseph A., 4,346,756, Cl. 165-48.00R.
Rice, Lynn H., 4,347,399, Cl. 585-738.000.
Upperton, Paul H., to GPG International Limited. Container. 4,346,805, Cl. 206-506.000.
Urban, Harry E.: *See—*
Schwager, Joseph E.; and Urban, Harry E., 4,347,403, Cl. 179-1.0SA.
USM Corporation: *See—*
Powderly, John, 4,346,804, Cl. 206-338.000.
Usui Kokusai Sangyo Kabushiki Kaisha: *See—*
Asada, Kikuo, 4,346,739, Cl. 138-143.000.
USV Pharmaceutical Corporation: *See—*
Suh, John T.; Williams, Bruce E.; Skiles, Jerry W.; and Loev, Bernard, 4,347,246, Cl. 424-246.000.
Uyehara, Otto A., to Health Guardian Company. Bedwetting detection device. 4,347,503, Cl. 340-604.000.
Uzawa, Koji: *See—*
Ohtsuga, Hisao; Uzawa, Koji; Kamuro, Takashi; Sudo, Susumu; Hirose, Tomoyoshi; Miyao, Masafumi; and Koga, Motoyuki, 4,346,922, Cl. 285-109.000.
Vagias, Alex M., to Vagias, Ernest. Thermoplastic key face for pianos or the like. 4,346,639, Cl. 84-437.000.
Vagias, Ernest: *See—*
Vagias, Alex M., 4,346,639, Cl. 84-437.000.
Vales, Richard J.: *See—*
Meyerhoff, Alfred; Kastovich, John C.; Richard, James A.; and Vales, Richard J., 4,346,845, Cl. 239-418.000.
Van Boekel-Mol, Grietje N.: *See—*
Minnema, Lourens; and Van Boekel-Mol, Grietje N., 4,347,288, Cl. 428-389.000.
Vandegraaf, Johannes J., to General Electric Company. Synthesizer having an injection synchronized divider. 4,347,484, Cl. 331-25.000.
Van Drumpt, Jan D.; and Beijleveld, Wilhelmus M., to Akzona Incorporated. Process for initiating radical reactions employing hydroximic acid derivatives. 4,347,342, Cl. 525-374.000.
Vaponics Inc.: *See—*
Smith, Verity C.; Baker, Robert J.; Barrow, Wyile W., Jr.; and Doane, H. Daniel, 4,346,923, Cl. 285-340.000.
Varco International, Inc.: *See—*
Boyadjieff, George I., 4,346,631, Cl. 81-57.340.
Vaughan, Christopher A., to Kango Electric Hammers Limited. Rotary impact drill. 4,346,767, Cl. 173-109.000.
VDO Adolf Schindling AG: *See—*
Kister, Horst; and Ullrich, Horst, 4,347,602, Cl. 370-85.000.
Vee Arc Corporation: *See—*
Ottoson, Allen E., 4,347,466, Cl. 318-301.000.
Veeder Industries, Inc.: *See—*
Evans, Alfred C.; and Smilgys, Bruno S., 4,347,435, Cl. 235-94.00R.
Vibco, Inc.: *See—*
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Victor Company of Japan, Ltd.: *See—*
Ishigaki, Yukinobu; and Ozaki, Hideaki, 4,347,510, Cl. 340-825.500.
Takanashi, Itsuo; Nakagaki, Shintaro; Miyoshi, Tadayoshi; Motoyama, Koichiro; Miyazaki, Kenichi; and Yokokawa, Sumio, 4,347,529, Cl. 358-44.000.
Vidal-Meza, Gonzalo D., to Caterpillar Tractor Co. Heat exchanger plate having distortion resistant uniform pleats. 4,346,760, Cl. 165-166.000.
Vigh, Zoltan, to Zepco, Inc. Gas turbine. 4,347,034, Cl. 415-92.000.
Villavicencio, Eduardo J., to W. R. Grace & Co. Process for producing newsprint. 4,347,101, Cl. 162-25.000.
Viswanathan, Raman: *See—*
Howells, Anthony P. S.; Viswanathan, Raman; and Angehrn, Jorg A., 4,346,593, Cl. 73-152.000.
Vitale, George, to Discovision Associates. Spindle clamp assembly for a video recorder-playback machine. 4,347,599, Cl. 369-270.000.
Volkswagenwerk Aktiengesellschaft: *See—*
Bluggel, Erwin; and Mainka, Wolfgang, 4,346,778, Cl. 180-268.000.
Hofbauer, Peter; Ehlers, Karsten; and Heidemeyer, Paulus, 4,346,773, Cl. 180-165.000.

Vollmuller, Helmut: *See*—
Bodenbenner, Kurt; Perkow, Helmut; and Vollmuller, Helmut, 4,347,144, Cl. 210-761.000.

von Aschwege, Gerd: *See*—
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Vondrowski, Gabriel: *See*—
Geisslinger, Wolfgang; Pustka, Karel; Bronner, Hermann; Mullritter, Ludwig; and Vondrowski, Gabriel, 4,346,616, Cl. 192-84.00C.

Vossieck, Paul, to Goetze AG. Valve seat ring. 4,346,684, Cl. 123-188.00S.

W. R. Grace & Co.: *See*—
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W. Schlafhorst & Co.: *See*—
Rohner, Joachim; and Wey, Edmund, 4,346,497, Cl. 15-301.000.

Wackerbarth, Folkard, to Dr. C. Otto & Comp. G.m.b.H. Regeneratively-operated coke oven. 4,347,106, Cl. 202-141.000.

Wade, James T.: *See*—
Morrison, Robert B.; Wade, James T.; and Zimmerman, Robert E., 4,346,790, Cl. 188-47.000.

Wadensten, Theodore S.; and Carocci, Alfred, to Vibco, Inc. Air blaster or air accumulator and quick dump apparatus. 4,346,822, Cl. 222-195.000.

Wagner, Gerard; and Schmid, Klaus. Solar panel. 4,346,693, Cl. 126-434.000.

Wagner, Herbert: *See*—
Hauck, Karl; Fehrenbach, Hubert; Mayer, Dieter; Wagner, Herbert; and Zwintzscher, Kurt, 4,347,091, Cl. 156-217.000.

Wagner, Robert L., to Ram Handler, Ltd. Feed and animal enclosure. 4,346,671, Cl. 119-60.000.

Wahlig, Helmut; Dingeldain, Elvira; and Braun, Dietrich, to Merck Patent Gesellschaft mit beschrankter Haftung. Medicinally useful, shaped mass of collagen resorbable in the body. 4,347,234, Cl. 424-15.000.

Wakita, Nobuaki; and Kanai, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Idle controller for an internal combustion engine. 4,346,686, Cl. 123-339.000.

Walker, Derek: *See*—
Cron, Martin J.; Keil, John G.; Lin, Jeng S.; Ruggeri, Mariano; and Walker, Derek, 4,347,354, Cl. 536-10.000.

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Walser, Armin; and Fryer, Rodney I., to Hoffmann-La Roche Inc. Imidazodiazepines. 4,347,364, Cl. 546-256.000.

Walser, Armin; and Fryer, Rodney I., to Hoffmann-La Roche Inc. Imidazodiazepines. 4,347,365, Cl. 546-256.000.

Walsh, Joseph F.: *See*—
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Walter, Berthold: *See*—
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Walters, Stephen: *See*—
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Wang, Kang-bo: *See*—
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Ware, Don A.; Coughlin, Steve A.; and Whatley, Oscie B., to ACF Industries, Incorporated. Arc-spot welding method and apparatus. 4,347,426, Cl. 219-125.100.

Warehime, Norwood R. Multi-team tug-of-war game apparatus. 4,346,884, Cl. 273-1.0GH.

Warehime, Norwood R. Handball game utilizing paired tethered balls. 4,346,902, Cl. 273-411.000.

Warne Surgical Products Limited: *See*—
Stewart, Mervin, 4,347,205, Cl. 264-130.000.

Warner & Swasey Company, The: *See*—
Frank, John H., 4,346,734, Cl. 137-506.000.

Warshawsky, Jerome, to I. W. Industries, Inc. Swivel joint. 4,347,557, Cl. 362-427.000.

Warulf, Olov: *See*—
Knudsen, Niels; Orpana, Veikko; Wisur, Matti; Warulf, Olov; Bergqvist, Hakan; and Afzelius, Raoul, 4,347,401, Cl. 174-14.00R.

Washburn, Robert B.: *See*—
Slama, William R.; Washburn, Robert B.; and Semanisin, Dale J., 4,347,277, Cl. 428-215.000.

Washo, Junichi, to Sharp Kabushiki Kaisha. Formation of an electrochromic display layer. 4,347,265, Cl. 427-108.000.

Watanabe Engineering Kabushiki Kaisha: *See*—
Watanabe, Mamoru, 4,346,792, Cl. 188-73.320.

Watanabe, Mamoru, to Watanabe Engineering Kabushiki Kaisha. Disc brake device. 4,346,792, Cl. 188-73.320.

Watanabe, Ryuji; and Kuniya, Keiichi, to Hitachi, Ltd. Electrodes of vacuum circuit breaker. 4,347,413, Cl. 200-144.00B.

Watanabe, Shinichiro, to Sawara Mfg. Works Co., Ltd.; and Fukushima Printing Industries Co., Ltd. Label applying apparatus. 4,347,094, Cl. 156-387.000.

Water Refining Company, Inc.: *See*—
Davis, Stephen H., 4,347,132, Cl. 210-104.000.

Watkins, Shelton, Jr. Honeycomb structure for use in abradable seals. 4,346,904, Cl. 277-236.000.

Watson, P. Keith; and Fraser, Lawrence J., to Xerox Corporation. Automatic development control. 4,346,985, Cl. 355-14.00D.

Wattron, Albert; and Quirin, Michel, to Belrecolt S.A. Agricultural machine for tedding and windrowing fodder crops. 4,346,549, Cl. 56-370.000.

Waxman, Jay S.: *See*—
Radkins, Andrew P.; Macarus, David P.; Radkins, James A.; and Waxman, Jay S., 4,347,217, Cl. 422-126.000.

Weatherford/Lamb, Inc.: *See*—
Kinzbach, Robert B., 4,346,629, Cl. 81-57.200.

Weavell, Jack; and Jatzek, Horst J., to CAE Machinery Ltd. Wafer slicing apparatus. 4,346,745, Cl. 144-176.000.

Weaver, Joe T., to Weaver Manufacturing Company. Piston construction for reciprocating pumps. 4,346,647, Cl. 92-243.000.

Weaver Manufacturing Company: *See*—
Weaver, Joe T., 4,346,647, Cl. 92-243.000.

Weber, Kurt; Rutsch, Peter; and Hirschinger, Lothar, to Carl Freudenberg, Firma. Dashboard for motor vehicles. 4,347,276, Cl. 428-160.000.

Weber, Lothar: *See*—
Fischer, Hermann; Friese, Karl-Hermann; Gruber, Hans-Ulrich; Heinemann, Wolfgang; Knoll, Gunter; Linder, Ernst; Maurer, Helmut; Noack, Rainer; Steinke, Leo; Weber, Lothar; and Weyl, Helmut, 4,347,113, Cl. 204-195.00S.

Weihe, Clyde R. Flatware processing system. 4,346,807, Cl. 211-60.00R.

Weishaupt, Walter; and Fournell, Hans-Dieter, to Bayerische Motoren Werke A.G. Burglarproofing device for automotive vehicles. 4,347,545, Cl. 361-172.000.

Welch, Richard M.: *See*—
Findlay, John W. A.; Butz, Robert F.; and Welch, Richard M., 4,347,178, Cl. 260-112.00B.

Welker, Robert H. Insertion regulator for pressurized pipelines. 4,346,611, Cl. 73-863.860.

Wells, Roderick A.: *See*—
Kavouras, Stephen P.; Post, Paul C.; Wells, Roderick A.; and Rutkowski, Stephen L., 4,347,618, Cl. 375-37.000.

Wells, Roger D.: *See*—
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Wells, William, to Korf Technologies, Inc. Method of operating an open-hearth furnace. 4,347,079, Cl. 75-52.000.

Welsch, John H.; Nicely, Charles W.; and Greene, Frederick C., to Metropolitan Wire Corporation. Shock resistant caster assembly. 4,346,498, Cl. 16-44.000.

Wenzel, Manfred, to Robert Bosch GmbH. Radio telephone communication network. 4,347,626, Cl. 455-18.000.

Werner, Jack R. Snap-lock container. 4,346,832, Cl. 229-4.500.

Werner, Peter: *See*—
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Wesner, Walter H.; and Wallace, Fred E., to AFA Consolidated Corporation. Child-resistant closures for container mounted spray dispensers. 4,346,821, Cl. 222-153.000.

Wessel, Wolf: *See*—
Stumpp, Gerhard; and Wessel, Wolf, 4,346,727, Cl. 137-117.000.

Wesseler, Eugene P., to Sterling Drug Inc. Novel polymeric compounds, processes and methods of use. 4,347,352, Cl. 528-423.000.

Westergaard, Carl, to Mitts & Merrill Inc. Shredding machine incorporating a torque cushioning assembly. 4,346,850, Cl. 241-36.000.

Western Electric Company, Inc.: *See*—
Haney, Eugene A.; and Partus, Fred P., 4,347,069, Cl. 65-3.120.
Pearce, Charles W.; and Schmidt, Paul F., 4,347,431, Cl. 219-390.000.
Pearcy, Robert E.; and Raus, James E., 4,347,552, Cl. 361-398.000.

Westinghouse Electric Corp.: *See*—
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Ferree, Herbert E., 4,346,550, Cl. 57-10.000.
Gary, Wardell; and Conroy, Ernest F., Jr., 4,347,540, Cl. 361-47.000.
Kemeny, George A.; and Litz, Donald C., 4,347,463, Cl. 318-135.000.
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Whatley, Oscie B.: *See*—
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Wherry, Joseph L., to Toledo Stamping & Manufacturing Company. Rocker arm and method of making same. 4,346,678, Cl. 123-90.440.

White, Claude C.; and Carr, Frederick, to Birmingham Bolt Company; and Jim Walter Resources, Inc. Mine roof bolt assembly. 4,347,020, Cl. 405-260.000.

White, Dale A.; Kluwe, Paul P.; and Greenwood, Leon D., to Eaton Stamping Company. Double insulated starter motor. 4,347,442, Cl. 290-48.000.

Whitehouse, Daniel L., to Solarex Corporation. Method of applying an antireflective and/or dielectric coating. 4,347,263, Cl. 427-74.000.

Whitehurst, Darrell D.; Mitchell, Thomas O.; and Farcasiu, Malvina, to Mobil Oil Corporation. Two-stage coal liquefaction. 4,347,116, Cl. 208-8.0LE.

Whiteside, George D.: *See—*
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Whitney, Douglass G.; and Martin, John K., III. Piston drive arrangement for injector. 4,346,707, Cl. 128-214.00F.

Whitney, John M., to Honeywell Inc. Room thermostat with electronic circuit board heat removal air wash. 4,347,443, Cl. 307-117.000.

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Wickstead, James C.: *See—*
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Wiese, Colin R. Hitch. 4,346,911, Cl. 280-478.00R.

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Wildman, Samuel G.; and Kwanyuen, Prachuab, to Leaf Proteins, Inc. Process for isolation of proteins from plant leaves. 4,347,324, Cl. 435-232.000.

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Wilke, Robert A., to Lake Center Industries. Electronic variable speed automotive blower control system. 4,347,468, Cl. 318-331.000.

Wilke, Wilbur D.; Hodge, Archie A.; Belshaw, Thomas E.; and Hamblin, John R., to Belshaw Bros., Inc. Doughnut making machine and improvements thereon. 4,346,649, Cl. 99-337.000.

Will, Fritz G., to General Electric Company. High capacity corrosion and erosion resistant electrodes for AC electrode boilers. 4,347,429, Cl. 219-288.000.

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Williams, Glenn L.; and Reilly, Edward J., to Gould Inc. Thermal array protection apparatus. 4,347,518, Cl. 346-1.100.

Williams, James W., to General Electric Company. Arrangement for cellular operation of a repeater trunking system. 4,347,625, Cl. 455-17.000.

Williams, Robert O. Pipe elbow insulator and protective jacket therefor. 4,346,740, Cl. 138-149.000.

Willis, John H.; and Heath, Trevor C., to TBA Industrial Products, Limited; and Bishop & Associates, Incorporated. Apparatus for production and cutting of glass fibres. 4,347,071, Cl. 65-10.200.

Willis, Robert F., to Burlington Industries, Inc. Positive pressure maintenance for sample presentation. 4,346,997, Cl. 356-244.000.

Willis, William J., to Rohco, Inc. Electrodeposition of copper, acidic copper electroplating baths and additives therefor. 4,347,108, Cl. 204-52.00R.

Wilson, Keith E.; and Blackmore, Phillip W., to Fiberglas Canada, Inc. Building insulation systems. 4,346,543, Cl. 52-404.000.

Wilson, Larry L.: *See—*
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Wilson, Robert J.: *See—*
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Winkless, Robert A.: *See—*
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Winter, Roland A. E.; and Dexter, Martin, to Ciba-Geigy Corporation. High caustic coupling process for preparing substituted 2-nitro-2'-hydroxyazobenzenes. 4,347,180, Cl. 260-206.000.

Wisur, Matti: *See—*
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Wixon, Harold E., to Colgate-Palmolive Company. Phosphate-free concentrated particulate heavy duty laundry detergent. 4,347,152, Cl. 252-174.000.

Wochnowski, Waldemar; and Hohm, Reinhard, to Hauni-Werke Korber & Co. KG. Method and apparatus for conditioning tobacco. 4,346,524, Cl. 34-26.000.

Wojtecki, Rudolph G.; and Kaan, Joseph P., to Eaton Corporation. Heat transfer apparatus for releasably securing heating or cooling means to pipe. 4,347,433, Cl. 219-535.000.

Wolf, Ludwig, Jr.: *See—*
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Wolstein, Friedrich; and Koch, Gerhard, to Uhde GmbH; and Kali Chemie AG. Process for defluorination of phosphoric acid. 4,347,228, Cl. 423-321.00R.

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Wood, David A. Shock absorber removing tool. 4,346,518, Cl. 30-272.00R.

Wood, Stanley E.; and Moore, Kenneth L., to United States of America, Navy. Level-shift and pulse shaping circuitry. 4,347,439, Cl. 250-222.00R.

Woodward, Roger P.: *See—*
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Workman, William, Jr., to Cooper Industries, Inc. Speed responsive motor shutoff mechanism for fluid operated tool. 4,346,765, Cl. 173-12.000.

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Wright, William B., Jr.; Tomcufcik, Andrew S.; and Marsico, Joseph W., Jr., to American Cyanamid Company. 2,3-Disubstituted-thiazolo[3,2-a]pyrimidines. 4,347,248, Cl. 424-251.000.

Wrightson, Noel T.; and Currie, Russell D., to Johnston Construction Limited; and Johnston Pipes Limited. Lining or relining of tunnels. 4,347,018, Cl. 405-150.000.

Wu, Che-Kuang, to Corning Glass Works. Photosensitive polyphosphate comprising Ag and Cl. 4,347,309, Cl. 430-616.000.

Wusthof, Peter; and Cunningham, Sinclair, to G. L. Rexroth GmbH. Hydraulic axial piston engine. 4,346,645, Cl. 91-501.000.

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Yajima, Seishi; Okamura, Kiyohito; Hasegawa, Yoshio; and Yamamura, Takemi, to Ube Industries, Ltd. Crosslinked organometallic block copolymers and process for production thereof. 4,347,347, Cl. 528-30.000.

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Yamagata, Sen: *See—*
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Yamakoshi, Akira; Murakami, Kyoichi; and Niimura, Tsutomu, to Sony Corporation. Circuit converting a pair of differential input signals to single-ended output signals. 4,347,531, Cl. 358-172.000.

Yamamoto, Katsuyuki: *See—*
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Yamashita, Kyoichi. Adhesive applicator. 4,347,095, Cl. 156-578.000.

Yamauchi, Junichi; Shibatani, Kyoichiro; Ikeguchi, Eiji; Omura, Ikuo; and Nagase, Yoshinori, to Kuraray Company, Limited. Dental caries detection. 4,347,233, Cl. 424-7.000.

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Yamaura, Mitsuru; Kondow, Ryotaro; Mitani, Megumu; and Nii, Yoshiji, to Tokyo Shibaura Denki Kabushiki Kaisha. Input setting method for digital operational devices. 4,347,581, Cl. 364-900.000.

Yan, Tsoung-Yuan, to Mobil Oil Corporation. Treatment of subterranean uranium-bearing formations. 4,346,936, Cl. 299-4.000.

Yanagida, Minoru; and Kono, Tomio, to Daido Tokushuko K.K. Austenitic free-cutting stainless steel. 4,347,080, Cl. 75-124.000.

Yanagishita, Hitoshi: *See*—
Sato, Atsushi; Takahashi, Naoya; Endo, Keiji; and Yanagishita, Hitoshi, 4,347,169, Cl. 252-567.000.

Yanagita, Seikichi, to Pilot Man-Nen-Hitsu Kabushiki Kaisha. Fountain pen equipped with a resiliency adjustment device. 4,347,011, Cl. 401-231.000.

Yanmar Diesel Engine Co., Ltd.: *See*—
Nagasaki, Michisuke; and Sannomiya, Shigehiro, 4,346,624, Cl. 74-784.000.

Yanobu, Hideo; and Tanaka, Tadashi, to Murata Kikai Kabushiki Kaisha. Method and apparatus for twisting and winding yarns on packages. 4,346,551, Cl. 57-62.000.

Yard, LeRoy A.: *See*—
Major, Jeffrey T.; Yard, LeRoy A.; and Holzscheiter, Danny B., 4,347,455, Cl. 310-239.000.

Yasnitsky, Boris G.; Tsukanova, Galina M.; Oridoroga, Valentin A.; and Furmanov, Jury A. Method of making absorbable surgical threads. 4,347,056, Cl. 8-116.00R.

Yasnitsky, Boris G.; Tsukanova, Galina M.; Oridoroga, Valentin A.; and Furmanov, Jury A. Method of making absorbable surgical sutures. 4,347,057, Cl. 8-116.00R.

Yasuda, Eturo; Segawa, Yoshihiro; and Ohta, Minoru, to Nippon Soken, Inc. Gas detector. 4,346,585, Cl. 73-23.000.

Yazaki Corporation: *See*—
Murofushi, Satoru; Shibuya, Tadao; Kato, Shinichi; and Endo, Mitsuo, 4,347,504, Cl. 340-638.000.

Yazaki, Shirokazu: *See*—
Ueno, Hitoshi; Yazaki, Shirokazu; and Ayukawa, Yukitada, 4,346,950, Cl. 312-138.00R.

Yellin, Tobias O.: *See*—
Gilman, David J.; Wardleworth, James M.; and Yellin, Tobias O., 4,347,370, Cl. 548-193.000.

Yim, Ernest W.: *See*—
Liang, Victor K. C.; Bouyssounouse, Bernard; and Yim, Ernest W., 4,346,512, Cl. 29-571.000.

Yokokawa, Sumio: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Miyoshi, Tadayoshi; Motoyama, Koichiro; Miyazaki, Kenichi; and Yokokawa, Sumio, 4,347,529, Cl. 358-44.000.

Yokokura, Teruo: *See*—
Mutai, Masahiko; Yokokura, Teruo; Kobayashi, Seizaburo; and Kato, Ikuo, 4,347,240, Cl. 424-92.000.

Yokomichi, Isao: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; Shigehara, Itaru; Nagatani, Kuniaki; and Nishimura, Shigeyuki, 4,347,390, Cl. 570-202.000.

Yokono, Hitoshi: *See*—
Sakurai, Hideki; Nakatani, Mitsuo; Oka, Hitoshi; Yokono, Hitoshi; and Isogai, Tokio, 4,347,304, Cl. 430-291.000.

Yokota, Hideo: *See*—
Kimura, Hiroyuki; Tamura, Shuichi; and Yokota, Hideo, 4,346,988, Cl. 356-1.000.

Yokouchi, Kishio; Ogawa, Hiromi; Yokoyama, Hiromitsu; Kamehara, Nobuo; Niwa, Koichi; and Murakawa, Kyohei, to Fujitsu Limited. Method of forming a ceramic circuit substrate. 4,346,516, Cl. 29-845.000.

Yokoyama, Hiromitsu: *See*—
Yokouchi, Kishio; Ogawa, Hiromi; Yokoyama, Hiromitsu; Kamehara, Nobuo; Niwa, Koichi; and Murakawa, Kyohei, 4,346,516, Cl. 29-845.000.

Yoneda, Tadao; and Tsunoda, Michinori, to Sawafuji Denki Kabushiki Kaisha. Starting device for an engine. 4,346,615, Cl. 74-7.00A.

Yonekawa, Yasuhiro: *See*—
Handa, Hajime; Yonekawa, Yasuhiro; Yamagata, Sen; Taki, Waro; Ikada, Yoshito; and Iwata, Hiroo, 4,346,712, Cl. 128-325.000.

Yonekura, Mikio: *See*—
Fukuyama, Hiroomi; Isobe, Shinichi; Yonekura, Mikio; and Kataoka, Minoru, 4,347,609, Cl. 371-34.000.

York-Luxaire, Inc.: *See*—
Meyerhoff, Alfred; Kastovich, John C.; Richard, James A.; and Vales, Richard J., 4,346,845, Cl. 239-418.000.

Yoshida, Tadao, to Sony Corporation. Pulse width modulated signal amplifier. 4,347,481, Cl. 330-251.000.

Yoshida, Tsunemasa: *See*—
Ono, Syoji; Miura, Shuzi; and Yoshida, Tsunemasa, 4,347,179, Cl. 260-112.00B.

Yoshii, Hiroe: *See*—
Yoshimura, Minoru; Takenaka, Yoshihiro; Ikeda, Shigeho; and Yoshii, Hiroe, 4,347,317, Cl. 435-110.000.

Yoshimura, Hirofumi: *See*—
Ikeda, Nobuo; Tanaka, Junzo; and Yoshimura, Hirofumi, 4,347,420, Cl. 219-10.55D.

Yoshimura, Minoru; Takenaka, Yoshihiro; Ikeda, Shigeho; and Yoshii, Hiroe, to Ajinomoto Company, Incorporated. Method for producing L-glutamic acid by fermentation. 4,347,317, Cl. 435-110.000.

Yoshino Kogyosho Co., Ltd.: *See*—
Suzuki, Sadao, 4,347,209, Cl. 264-250.000.

Yoshioka, Toshio; Teramoto, Kazuo; and Shimamura, Masaharu, to Toray Industries, Inc. Process for isomerizing glucose to fructose. 4,347,316, Cl. 435-94.000.

Young, Leroy. Device for skinning small animals. 4,346,499, Cl. 17-44.300.

Young, Rodney C.: *See*—
Durant, Graham J.; Ganellin, Charon R.; Owen, Geoffrey R.; and Young, Rodney C., 4,347,250, Cl. 424-263.000.

Younge, Earl G. Placer mineral concentrator and process. 4,347,130, Cl. 209-452.000.

Yuan, Shao W. Natural ice for cooling energy. 4,346,569, Cl. 62-260.000.

Zaidan Hojin Handotai Kenkyu Shinkokai: *See*—
Nishizawa, Junichi; and Shimbo, Masafumi, 4,346,513, Cl. 29-580.000.

Zaitsu, Eizo, to Shinagawa Machinery Works Co., Ltd. Continuous-processing type hot-water sterilizer and food cooker. 4,346,650, Cl. 99-361.000.

Zamma, Jun; Makino, Isao; Mii, Toshiyuki; and Shima, Kazumi, to Toyo Engineering Corporation. Catalytic converter. 4,347,221, Cl. 422-207.000.

Zanardi, Mauro: *See*—
Bezzi, Giovanni; Pauluzzi, Ego; and Zanardi, Mauro, 4,347,200, Cl. 264-9.000.

Zapf, Karl J.: *See*—
Hoffmann, Kurt; and Zapf, Karl J., 4,347,588, Cl. 365-206.000.

Zeitrager, Gunther; Krause, Gerhard; and Guthmann, Herbert, to General Motors Corporation. Attachment device for a brake hose. 4,346,863, Cl. 248-75.000.

Zeller, Bernard M.; Couturier, Rene J.; and Tribot, Robert A., to Societe Nationale des Poudres et Explosifs. Granular propellant powder based on nitrocellulose, oily nitrate ester and polyvinyl nitrate, and process. 4,347,087, Cl. 149-98.000.

Zemke, Edward H.: *See*—
Guenther, Kenneth L.; Kosner, Jerry J., Jr.; Erikson, Rolf B.; and Zemke, Edward H., 4,346,876, Cl. 271-11.000.

Zenith Radio Corporation: *See*—
Flasza, Michael D.; and Rypkema, Jouke N., 4,347,483, Cl. 331-12.000.
Johnson, Fred D.; and Tzakis, George J., 4,347,528, Cl. 358-10.000.

Zeno, John R.; and Rosenhagen, William, to Ideal Toy Corporation. Decorative light flashing apparatus and acousto-electric transducer therefor. 4,346,640, Cl. 84-464.00R.

Zepco, Inc.: *See*—
Vigh, Zoltan, 4,347,034, Cl. 415-92.000.

Zimmerman, Robert E.: *See*—
Morrison, Robert B.; Wade, James T.; and Zimmerman, Robert E., 4,346,790, Cl. 188-47.000.

Ziv, Avraham: *See*—
Hollowell, William M.; and Ziv, Avraham, 4,346,858, Cl. 242-107.000.

Zumstein, Bruno, to BBC Brown, Boveri & Company Limited. Bypass control apparatus for turbocharged internal-combustion engines. 4,346,559, Cl. 60-606.000.

Zurawski, John F., to GTE Automatic Electric Labs Inc. Pulse detector circuit. 4,347,406, Cl. 179-18.00D.

Zwintzscher, Kurt: *See*—
Hauck, Karl; Fehrenbach, Hubert; Mayer, Dieter; Wagner, Herbert; and Zwintzscher, Kurt, 4,347,091, Cl. 156-217.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 31ST DAY OF AUGUST, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bosso, Joseph F.: *See*—
Buchwalter, Stephen L.; Bosso, Joseph F.; and Christenson, Roger M., Re. 31,022, Cl. 523-418.000.

Buchwalter, Stephen L.; Bosso, Joseph F.; and Christenson, Roger M., to PPG Industries, Inc. Michael adducts of polymeric materials useful in coating applications. Re. 31,022, Cl. 523-418.000.

Christenson, Roger M.: *See*—
Buchwalter, Stephen L.; Bosso, Joseph F.; and Christenson, Roger M., Re. 31,022, Cl. 523-418.000.

Evangelista, Fred J. Stringless electronic musical instrument. Re. 31,019, Cl. 84-1.160.

Eyelet Specialty Co., Inc.: *See*—
Idec, Eric J.; Klimeck, Edward F.; and Hultgren, Eric A., Re. 31,021, Cl. 401-194.000.

Funk, Charles F., to Met-L-Parts, Inc. Method of making a lined conduit section. Re. 31,020, Cl. 228-122.000.

Hultgren, Eric A.: *See*—
Idec, Eric J.; Klimeck, Edward F.; and Hultgren, Eric A., Re. 31,021, Cl. 401-194.000.

Idec, Eric J.; Klimeck, Edward F.; and Hultgren, Eric A., to Eyelet Specialty Co., Inc. Cosmetic applicator with transparent container portion. Re. 31,021, Cl. 401-194.000.

Klimeck, Edward F.: *See*—
Idec, Eric J.; Klimeck, Edward F.; and Hultgren, Eric A., Re. 31,021, Cl. 401-194.000.

Met-L-Parts, Inc.: *See*—
Funk, Charles F., Re. 31,020, Cl. 228-122.000.

PPG Industries, Inc.: *See*—
Buchwalter, Stephen L.; Bosso, Joseph F.; and Christenson, Roger M., Re. 31,022, Cl. 523-418.000.

LIST OF DESIGN PATENTEES

Aavid Engineering, Inc.: *See*—
McCarthy, Alfred F., 265,987, Cl. D13-23.000.

Airwick Industries, Inc.: *See*—
Gombert, Jean-Marie, 265,973, Cl. D9-366.000.
Gombert, Jean-Marie, 265,974, Cl. D9-366.000.

Akanuma, Youichiro: *See*—
Ariga, Kazuo; and Akanuma, Youichiro, 266,026, Cl. D26-3.000.

Akzona Incorporated: *See*—
Chizacky, John M., 265,981, Cl. D10-57.000.

American Cyanamid Company: *See*—
Black, Seymour, 265,972, Cl. D9-339.000.

Arfert, Horst F. W., to Reynolds Metals Company. Can carrier. 265,979, 8-31-82, Cl. D9-344.000.

Ariga, Kazuo; and Akanuma, Youichiro, to Stanley Electric Co., Ltd. Fluorescent lamp. 266,026, 8-31-82, Cl. D26-3.000.

Astor, Barbara; and Snyder, Terry E., to Revlon, Inc. Display holder. 265,976, 8-31-82, Cl. D9-415.000.

Aulenti, Gae, to Knoll International, Inc. Chair. 265,954, 8-31-82, Cl. D6-73.000.

Baruffa, Olindo, to Mefina S.A. Sprinkler for an ironing press. 265,999, 8-31-82, Cl. D32-25.000.

Beitler, Myron; and Johnston, John N., to Litton Business Systems, Inc. Calculator keyboard module. 266,005, 8-31-82, Cl. D18-7.000.

Bergin, Paul. Hatch for a power supply cord. 265,968, 8-31-82, Cl. D8-352.000.

Black & Decker, Inc.: *See*—
House, Lawrence E., II, 265,985, Cl. D13-4.000.

Black, Seymour, to American Cyanamid Company. Dispenser for surgical sutures. 265,972, 8-31-82, Cl. D9-339.000.

Blum, Alan E.; and Gambon, Thomas F., to Charleswood Furniture Corp. Corner connector for furniture panels. 265,959, 8-31-82, Cl. D6-191.000.

Boyd, Raymond. Illuminated mirror case. 266,028, 8-31-82, Cl. D28-82.000.

Braun Aktiengesellschaft: *See*—
Hartwein, Peter; and Schneider, Peter, 265,990, Cl. D14-34.000.

Canon Kabushiki Kaisha: *See*—
Hirata, Takashi; and Hirose, Kunio, 265,992, Cl. D14-57.000.
Kando, Masahiro; and Sugiura, Yoshinori, 265,996, Cl. D14-107.000.
Kando, Masahiro; and Kato, Nori, 265,997, Cl. D14-111.000.

Cardinal American Corporation: *See*—
Theodore, George, 265,952, Cl. D6-45.000.

Carney, Shirley. Desk accessory for holding rubber bands and paper clips and the like. 266,009, 8-31-82, Cl. D19-75.000.

Carruthers, Thomas R., to Fleming Fabrications Limited. Heat exchanger. 266,022, 8-31-82, Cl. D23-136.000.

Charleswood Furniture Corp.: *See*—
Blum, Alan E.; and Gambon, Thomas F., 265,959, Cl. D6-191.000.

Chizacky, John M., to Akzona Incorporated. Sterilization indicator. 265,981, 8-31-82, Cl. D10-57.000.

Cofer, Donald G., to Cofer and Fitzgerald. Golf game target. 266,010, 8-31-82, Cl. D21-8.000.

Cofer and Fitzgerald: *See*—
Cofer, Donald G., 266,010, Cl. D21-8.000.

CPG Products Corp.: *See*—
Holland, Kathleen A., 266,011, Cl. D21-13.000.

Crossman, Raymond R. Propane tank safety pressure vent valve. 266,019, 8-31-82, Cl. D23-19.000.

Datasaab AB: *See*—
Freijd, Ingvar, 265,966, Cl. D8-346.000.

Davis, Edwin W.; and Weinerman, Lee S., to Eastern Company, The. Latch housing with push button. 265,965, 8-31-82, Cl. D8-302.000.

Dilyard, Richard D., to Rubbermaid Incorporated. Watering can. 266,018, 8-31-82, Cl. D23-11.000.

Eastern Company, The: *See*—
Davis, Edwin W.; and Weinerman, Lee S., 265,965, Cl. D8-302.000.

Farnsworth, Donald L.: *See*—
Perry, Floyd F.; and Farnsworth, Donald L., 266,013, Cl. D21-5.000.

Fleming Fabrications Limited: *See*—
Carruthers, Thomas R., 266,022, Cl. D23-136.000.

Fontaine Industries, Inc.: *See*—
Jennie, Fred L., 265,978, Cl. D9-453.000.

Freijd, Ingvar, to Datasaab AB. Hood for preventing observation of a keyset. 265,966, 8-31-82, Cl. D8-346.000.

Fujisawa, Seizaburo, to Orion Machinery Co., Ltd. Chain for waste removal conveyor for a barn. 266,029, 8-31-82, Cl. D34-29.000.

Gambon, Thomas F.: *See*—
Blum, Alan E.; and Gambon, Thomas F., 265,959, Cl. D6-191.000.

Gombert, Jean-Marie, to Airwick Industries, Inc. Dispenser for cleaning powders. 265,973, 8-31-82, Cl. D9-366.000.

Gombert, Jean-Marie, to Airwick Industries, Inc. Dispenser for solid material. 265,974, 8-31-82, Cl. D9-366.000.

Gordon, John B. Inline fuse holder. 265,988, 8-31-82, Cl. D13-35.000.

Harris, Bobby J.; and Sayers, James P. Container for small electronic structural components. 265,989, 8-31-82, Cl. D13-41.000.

Hartwein, Peter; and Schneider, Peter, to Braun Aktiengesellschaft. Columnar loudspeaker. 265,990, 8-31-82, Cl. D14-34.000.

Henkels, Walter. Combined holder for a magnifier and a letter-opener. 265,964, 8-31-82, Cl. D8-104.000.

Hirata, Takashi; and Hirose, Kunio, to Canon Kabushiki Kaisha. Acoustic coupler. 265,992, 8-31-82, Cl. D14-57.000.

Hirose, Kunio: *See*—
Hirata, Takashi; and Hirose, Kunio, 265,992, Cl. D14-57.000.

Holland, Kathleen A., to CPG Products Corp. Electronic game housing. 266,011, 8-31-82, Cl. D21-13.000.

House, Lawrence E., II, to Black & Decker, Inc. Rechargeable battery pack. 265,985, 8-31-82, Cl. D13-4.000.

Interdica S.A.: *See*—
Kanoui, Joseph, 265,980, Cl. D10-26.000.
Kaufmann, Albert, 265,971, Cl. D9-337.000.

International Business Machines Corporation: *See*—
Kneale, Collan B., 265,995, Cl. D14-107.000.

Iscar Ltd.: *See*—
Wertheimer, Zeev, 266,001, Cl. D15-140.000.

Ishibashi, Kenji: *See*—
Onda, Hiroyuki; and Ishibashi, Kenji, 266,004, Cl. D18-3.000.

Izumisawa, Osamu. Ratchet type socket wrench. 265,962, 8-31-82, Cl. D8-25.000.

Jennie, Fred L., to Fontaine Industries, Inc. Cap for telescopic sight turret. 265,978, 8-31-82, Cl. D9-453.000.

Johnston, John N.: *See*—
Beitler, Myron; and Johnston, John N., 266,005, Cl. D18-7.000.

Jonathan Bradley Pens, Inc.: *See—*
Salinger, Jerome P., 266,007, Cl. D19-42.000.

Kando, Masahiro; and Sugiura, Yoshinori, to Canon Kabushiki Kaisha. Controller for computer printing system. 265,996, 8-31-82, Cl. D14-107.000.

Kando, Masahiro; and Kato, Nori, to Canon Kabushiki Kaisha. Printer for computer system. 265,997, 8-31-82, Cl. D14-111.000.

Kanoui, Joseph, to Interdica S.A. Alarm clock. 265,980, 8-31-82, Cl. D10-26.000.

Kato, Nori: *See—*
Kando, Masahiro; and Kato, Nori, 265,997, Cl. D14-111.000.

Kaufmann, Albert, to Interdica S.A. Perfume bottle. 265,971, 8-31-82, Cl. D9-337.000.

Kawakami, Naoya, to Sawafuji Electric Co., Ltd. Electric refrigerator. 266,000, 8-31-82, Cl. D15-88.000.

Kellogg, Harlan F. Watering can. 266,017, 8-31-82, Cl. D23-11.000.

Kelsey-Hayes Co.: *See—*
Main, John A., 265,984, Cl. D12-212.000.

Kilham, Peter. Wood burning stove. 266,021, 8-31-82, Cl. D23-97.000.

Klawitter. Ronald R., to Steven Manufacturing Company. Toy driving simulator. 266,008, 8-31-82, Cl. D19-63.000.

Kneale, Collan B., to International Business Machines Corporation. Control unit for a distributed data system. 265,995, 8-31-82, Cl. D14-107.000.

Knoll International, Inc.: *See—*
Aulenti, Gae, 265,954, Cl. D6-73.000.

Koessler, Juergen R. Wire mounting clip. 265,969, 8-31-82, Cl. D8-354.000.

Kojima, Fumiyo: *See—*
Yoshihama, Manzo; and Kojima, Fumiyo, 265,994, Cl. D14-94.000.

Lerner, Lily. Eyeglass case. 265,946, 8-31-82, Cl. D3-34.000.

Lieber, Thomas G., to Spellbinder Inc. Guitar. 266,003, 8-31-82, Cl. D17-14.000.

Litton Business Systems, Inc.: *See—*
Beitler, Myron; and Johnston, John N., 266,005, Cl. D18-7.000.

Lonnstedt, Bo G. Support for ear protector. 265,945, 8-31-82, Cl. D2-232.000.

Ludvik, Joseph: *See—*
Wearsch, Henry W.; Marino, Ronald A.; Ludvik, Joseph; and Rowe, William H., 265,986, Cl. D13-13.000.

M & M Luggage Co., Inc.: *See—*
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Stark, Ted, 265,949, Cl. D3-71.000.

Main, John A., to Kelsey-Hayes Co. Vehicle wheel. 265,984, 8-31-82, Cl. D12-212.000.

Manufacture Metallurgique de Tournus, S.A.: *See—*
Vaussanvin, Marcel, 265,975, Cl. D9-406.000.

Marino, Ronald A.: *See—*
Wearsch, Henry W.; Marino, Ronald A.; Ludvik, Joseph; and Rowe, William H., 265,986, Cl. D13-13.000.

Markus, Frederick E. Shelving unit. 265,958, 8-31-82, Cl. D6-186.000.

Martin, Rosemary E. A. Rocking seat. 265,950, 8-31-82, Cl. D6-10.000.

McCarthy, Alfred F., to Aavid Engineering, Inc. Self-holding heat sink for electronic devices. 265,987, 8-31-82, Cl. D13-23.000.

McCarthy, Richard. Chair back or similar article. 265,960, 8-31-82, Cl. D6-197.000.

McLachlan, Walter A. Combined treatment table and cabinet assembly. 266,023, 8-31-82, Cl. D24-3.000.

Meelen, Hans T., to U.S. Philips Corporation. Clock radio receiver. 265,993, 8-31-82, Cl. D14-73.000.

Mefina S.A.: *See—*
Baruffa, Olindo, 265,999, Cl. D32-25.000.

Mikiya, Toshio; and Mogaki, Tadahisa, to Nikki Co., Ltd. Face washer. 266,020, 8-31-82, Cl. D23-48.000.

Miller, Wayne. Hopper dump truck box. 265,982, 8-31-82, Cl. D12-15.000.

Mogaki, Tadahisa: *See—*
Mikiya, Toshio; and Mogaki, Tadahisa, 266,020, Cl. D23-48.000.

Molnlycke AB: *See—*
Ternstrom, Maj I.; and Widlund, Leif R. U., 266,024, Cl. D24-50.000.

Moore, Laverne B.: *See—*
Murdock, Harold G.; and Moore, Laverne B., 265,963, Cl. D8-98.000.

Murdock, Harold G.; and Moore, Laverne B. Slitter. 265,963, 8-31-82, Cl. D8-98.000.

Musashi Kabushiki Kaisha: *See—*
Onda, Hiroyuki; and Ishibashi, Kenji, 266,004, Cl. D18-3.000.

Newman, Fredric M. Electric outlet cover. 265,967, 8-31-82, Cl. D8-350.000.

Nienstaedt, Peter. Pouch. 265,947, 8-31-82, Cl. D3-52.000.

Nikki Co., Ltd.: *See—*
Mikiya, Toshio; and Mogaki, Tadahisa, 266,020, Cl. D23-48.000.

Northern Telecom Limited: *See—*
Trussler, Peter D. H., 265,991, Cl. D14-52.000.

Olko, Henry. Chair. 265,953, 8-31-82, Cl. D6-57.000.

Onda, Hiroyuki; and Ishibashi, Kenji, to Musashi Kabushiki Kaisha. Paper sheet counter. 266,004, 8-31-82, Cl. D18-3.000.

Orion Machinery Co., Ltd.: *See—*
Fujisawa, Seizaburo, 266,029, Cl. D34-29.000.

Patton, John C. Combined football kicker's practice mat and auxiliary tee. 266,015, 8-31-82, Cl. D21-209.000.

Pearson, Clark: *See—*
Wolf, Gregory; Sandman, Scott; and Pearson, Clark, 265,956, Cl. D6-127.000.
Wolf, Gregory; Sandman, Scott; and Pearson, Clark, 265,957, Cl. D6-170.000.

Perry, Floyd F.; and Farnsworth, Donald L. Game target. 266,013, 8-31-82, Cl. D21-5.000.

Polhemus, Elmer N.; and Retzer, Theodore C., to Westinghouse Electric Corp. High-intensity discharge lamp. 266,025, 8-31-82, Cl. D26-2.000.

Raftery, William B.; and Whitwam, Ronald L., to Steelcase Inc. Seat. 265,955, 8-31-82, Cl. D6-75.000.

Reliance Electric Company: *See—*
Wearsch, Henry W.; Marino, Ronald A.; Ludvik, Joseph; and Rowe, William H., 265,986, Cl. D13-13.000.

Retzer, Theodore C.: *See—*
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Revlon, Inc.: *See—*
Astor, Barbara; and Snyder, Terry E., 265,976, Cl. D9-415.000.

Reynolds Metals Company: *See—*
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Ricoh Company, Ltd.: *See—*
Yoshihama, Manzo; and Kojima, Fumiyo, 265,994, Cl. D14-94.000.

Rodriguez, Daniel E.: *See—*
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Roulo, Georgia L. M. Typeface. 266,006, 8-31-82, Cl. D18-24.000.

Rowe, William H.: *See—*
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Rubbermaid Incorporated: *See—*
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Salinger, Jerome P., to Jonathan Bradley Pens, Inc. Ballpoint pen. 266,007, 8-31-82, Cl. D19-42.000.

Sandman, Scott: *See—*
Wolf, Gregory; Sandman, Scott; and Pearson, Clark, 265,956, Cl. D6-127.000.
Wolf, Gregory; Sandman, Scott; and Pearson, Clark, 265,957, Cl. D6-170.000.

Sanna, Charles A. Golf putter head. 266,016, 8-31-82, Cl. D21-217.000.

Saunders, Charles A., IV. Motorcycle headlight boot. 266,027, 8-31-82, Cl. D26-139.000.

Sawafuji Electric Co., Ltd.: *See—*
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Lieber, Thomas G., 266,003, Cl. D17-14.000.

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Stark, Ted, to M & M Luggage Co., Inc. Garment bag. 265,949, 8-31-82, Cl. D3-71.000.

Steelcase Inc.: *See—*
Raftery, William B.; and Whitwam, Ronald L., 265,955, Cl. D6-75.000.

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Klawitter, Ronald R., 266,008, Cl. D19-63.000.

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Wagle, Joseph H.: *See*—
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Sullivan, Patrick F.; and Wakefield, Russell R., 265,983, Cl. D12-181.000.

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Polhemus, Elmer N.; and Retzer, Theodore C., 266,025, Cl. D26-2.000.

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Meek, Jack M.; and Duffett, William E., 4,883, Cl. 74.000.

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ISSUED AUGUST 31, 1982

NOTE.—First number, class; second number, subclass; third number, patent number

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19 4,346,481

CLASS 3

13 4,346,482

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243.52 4,346,507
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452 4,346,510
458 4,346,511
571 4,346,512
580 4,346,513
740 4,346,514
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180 R 4,346,520
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17 4,346,523
26 4,346,524

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259 4,346,526
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CLASS 56

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160 4,346,567
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9 4,347,070
10.2 4,347,071
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313 4,346,574

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271 4,346,578
314 4,346,579
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61.2 4,346,587
105 4,346,588
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151 4,346,590
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152 4,346,592
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597 4,346,599
768 4,346,600
829 4,346,601
842 4,346,602
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861.12 4,346,604
861.13 4,346,605
861.41 4,346,606
861.75 4,346,607
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863.86 4,346,611
864.44 4,346,612
864.51 4,346,613

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583 4,346,620
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784 4,346,624
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866 4,346,626
869 4,346,627

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52 4,347,079
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157.5 4,347,081
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57.34 4,346,631
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CLASS 92

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361 4,346,650
392 4,346,651
483 4,346,652

CLASS 100

37 4,346,653
268 4,346,654

CLASS 101

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181 4,346,656
269 4,346,657

CLASS 102

254 4,346,658

CLASS 104

247 4,346,659

CLASS 110

235 4,346,660
259 4,346,661

CLASS 114

20 R 4,346,662
295 4,346,663
349 4,346,664

CLASS 116

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665 4,346,668
733 4,346,669

CLASS 119

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CLASS 122

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41.74 4,346,676
54 B 4,346,677
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179 L 4,346,681
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193 P 4,346,685
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CLASS 125

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CLASS 128

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1 R 4,346,697
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260 4,346,709
272 4,346,710
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660 4,346,717
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CLASS 134

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CLASS 135

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117 4,346,727
243.6 4,346,728
353 4,346,729
375 4,346,730
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506 4,346,734
606 4,346,735
625.48 4,346,736

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149 4,346,740

CLASS 139

387 R 4,346,741

CLASS 141

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CLASS 145

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CLASS 148

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101 4,347,086

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98 4,347,087

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222 4,346,748

CLASS 156

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149 4,347,090
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227 4,347,092
242 4,347,093
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444 4,347,095
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4 4,346,762

CLASS 172

2 4,346,763
42 4,346,764

CLASS 173

12 4,346,765
23 4,346,766
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118 4,346,768
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CLASS 175

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CLASS 177

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1 GB 4,347,404
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18 D 4,347,406
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99 P 4,347,409
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CLASS 180

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165 4,346,773
167 4,346,774
175 4,346,775
179 4,346,776
220 4,346,777
268 4,346,778

CLASS 181

120 4,346,779
198 4,346,780
206 4,346,781
207 4,346,782
230 4,346,783

CLASS 182

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CLASS 184

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CLASS 185

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CLASS 187

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CLASS 188

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134 4,346,793
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412 4,346,800
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533 4,346,802
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67 G 4,347,417
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654 4,347,139
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721 4,347,141
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69 M 4,347,422
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CLASS 220

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75 4,346,814
306 4,346,815
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CLASS 221

312 R 4,346,817

CLASS 222

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83 4,346,820
153 4,346,821
195 4,346,822
443 4,346,823
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CLASS 223

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CLASS 224

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CLASS 225

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CLASS 242

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CLASS 266

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302.1 4,346,875

CLASS 271

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121 4,346,879
186 4,346,880
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221 4,346,882
274 4,346,883

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271 4,346,897
274 4,346,900
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110 4,346,921
340 4,346,923

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CLASS 292

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336.3 4,346,925
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CLASS 294

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107 4,346,930
148 4,346,931
216 4,346,932

CLASS 297

89 4,346,933

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8 4,346,937
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45 4,346,939
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CLASS 303

6 C 4,346,941
92 4,346,942
119 4,346,943
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255 4,347,445
443 4,347,446
548 4,347,447
583 4,347,448

CLASS 308

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4,346,947
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236 4,346,949

CLASS 310

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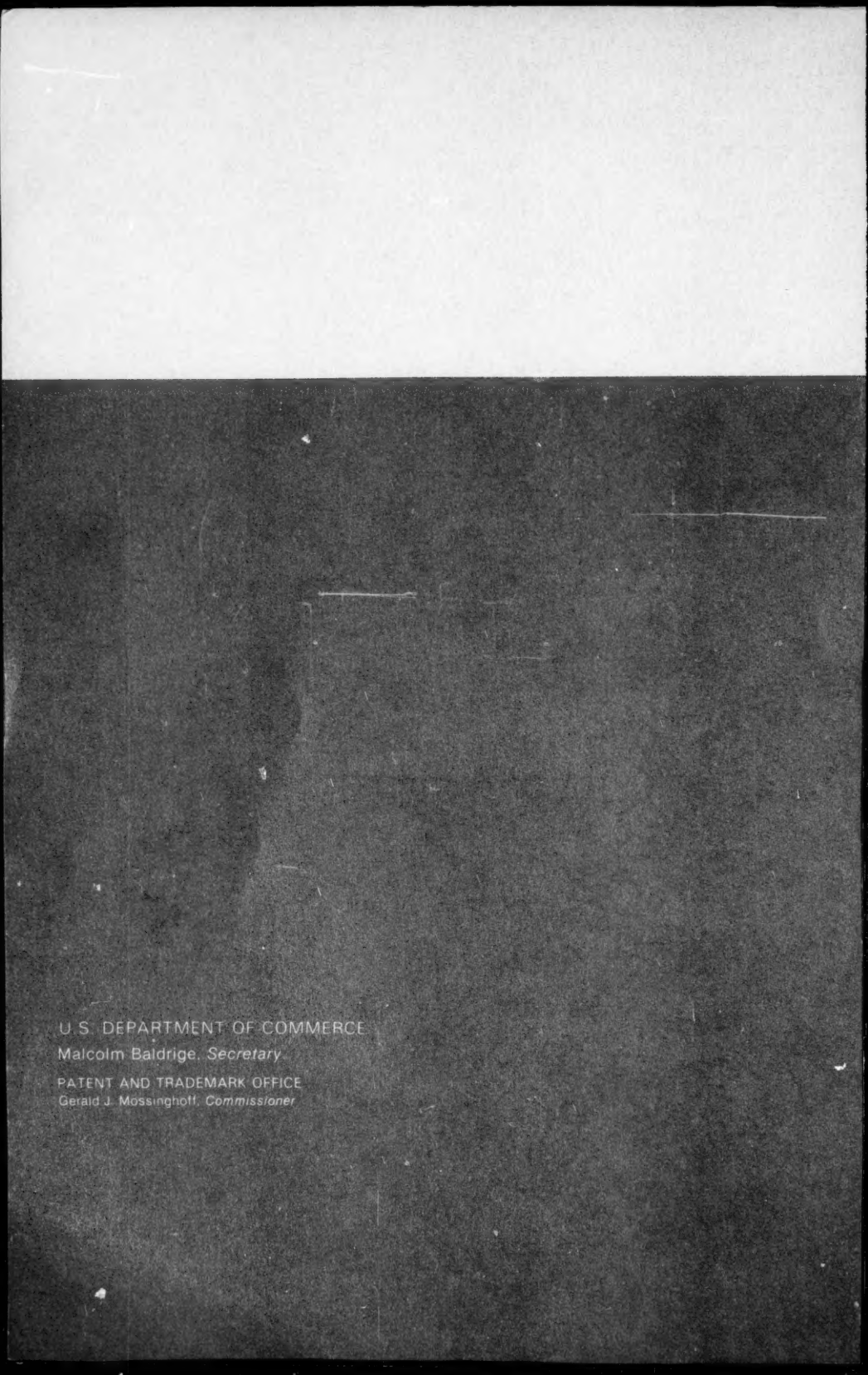

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